Forget Convergence: Divergence Past, Present, and Future

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Looking for evidence of income convergence among the world's nations has become a fashionable pursuit. Far from narrowing, the gap between the incomes of the rich and poor countries has grown markedly and is likely to widen further.

CONVERGENCE—the tendency for poorer countries to grow faster than richer ones and, hence, for their levels of income to converge—has recently received a great deal of attention in the economics literature. Along with "globalization" and "competitiveness," the theme of "convergence" has spilled over into public discussions of policies and prospects for developing countries. Well, forget convergence—the overwhelming feature of modern economic history is a massive divergence in per capita incomes between rich and poor countries, a gap which is continuing to grow today. Moreover, unless the future is different in important ways from the recent past, we can expect this gap to grow ever wider.

Divergence past

The very feature that marks the beginning of modern economic history also implies a major increase in the difference in per capita incomes across nations. Call it the industrial revolution, the emergence of modern capitalism, or the take-off into sustained growth, at some point in the late nineteenth century the annual growth rates of the now-rich industrial countries accelerated from historically low levels (0.5 percent or less), to 1–2 percent per year. The fact that this acceleration was not universal, or even widespread, implies that the gap between rich and poor countries' growth rates widened and the gulf between their per capita incomes—which was probably already wide—began to grow.

Given different exchange rates and different mixes of tradable and nontradable goods among countries, how can we compare income levels? We can compare them by using purchasing-power-adjusted measures of income. One important feature of this adjustment of incomes is to account for the relative cheapness of nontradables in poorer countries. Using a purchasing-power-parity measure substantially raises the estimate of income of poor countries relative to their income expressed in US dollars at official exchange rates—typically by a factor of 3 to 5, depending on particular countries' prices.

Measured in purchasing-power-parity terms at 1985 prices (P$), the ratio of the per capita income of the richest country (the United States) to the average per capita income of the poorest countries grew from around 9 (P$2,181 compared with P$250) in 1870 to over 50 (P$16,779 compared with P$325) in 1960. In absolute terms, the income gap between countries grew even more, expanding more than eightfold over this period. The average absolute difference between the income of the richest country and the incomes of all others was about P$1,500 in 1870 but, by 1960, this gap had grown to P$12,662.

Alert readers may wonder how the incomes of poor countries in 1870 can be estimated. Most of the industrial countries have roughly comparable estimates of GDP per capita extending back to 1870. In contrast, GDP estimates for most developing countries began only in 1950 or 1960. Moreover, most did not even exist as independent countries with their present boundaries in 1870. How then can we venture to guess what the evolution of income gaps from 1870 to 1960 might have been?

It can be done. Suppose that we only needed to estimate the change in the gap between the richest and the poorest country between 1870 and 1960. To do this we would need the income of today's richest country in 1870 and 1960 (P$2,181 and P$9,900, respectively), and the average income of today's poorest country—Ethiopia—for those years. The data for the United States are available, as is the income per capita of Ethiopia in 1960 (P$260). What is missing is Ethiopia's per capita income in 1870. But we are not stuck, because if we can make a sufficiently good guess at how low incomes could possibly have been in 1870, we can work backward by a process of deduction to estimate income divergence for all countries.

Since we know the growth rate of the United States over the entire period, we also know that the ratio of US income per capita in 1960 to its level in 1870 is about 4.5. If Ethiopia grew faster than the United States over this period, then the ratio of Ethiopia's per capita income in 1960 to its level in 1870 would have to be larger than 4.5. But, if the ratio between Ethiopia's 1960 income and the lowest it could plausibly have been in 1870 is smaller than 4.5, then we know that Ethiopia in fact grew more slowly than the United States and, hence, that there has been a divergence in per capita incomes between the world's richest country and the poorest countries. Moreover, applying this

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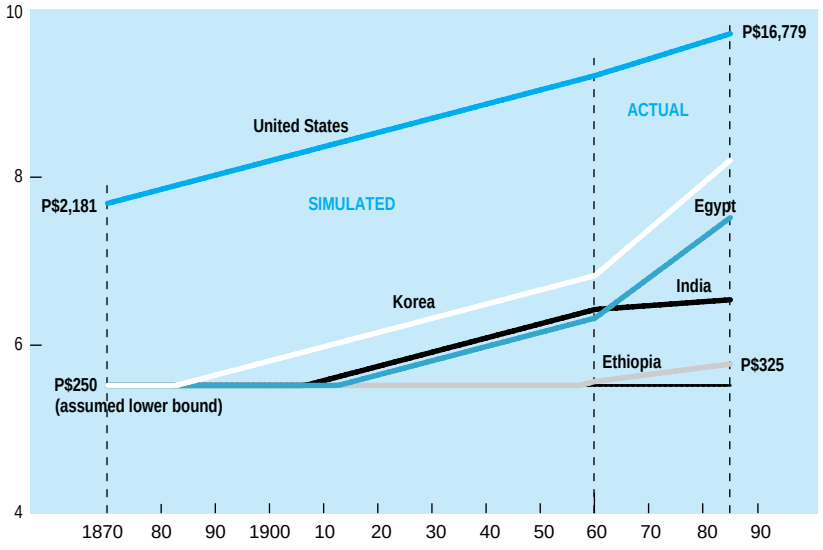
methodology to other countries, we can make rough guesses of the average magnitude of divergence in the cross-national distribution of income.

In "Divergence, Big Time," a background study for the World Bank's *World Development Report 1995*, five different methods were used to estimate the lower bound of incomes: the lowest recorded incomes in the data available for 1960–90; current estimates of poverty lines (the level of income that defines poverty in a given country); incomes required for nutritional adequacy; the relationship between income, mortality, and demographic sustainability; and known historical estimates of income. Using these five distinct approaches we arrived at a figure of P$250 as a reasonable guess at the lowest level that income could have reached in 1870.

But using this lower bound of P$250, we extrapolate incomes backward from per capita incomes observed today. For example, assume that every country grew at the same rate as the richest country (of course, to generate convergence, poorer countries would need to have grown even faster). But it is simply impossible for the countries considered poor today to have grown that fast on average since 1870, as the assumption of equal growth rates—or equivalently, of no divergence—implies impossibly low incomes for those countries in 1870. Therefore, for historical growth rates to be compatible with the current level of income in poor countries, growth must have been considerably slower for the poor countries than for the leaders. Even without historical data, we know that there has been massive divergence in income levels since 1870 (see chart).

The income gap has grown manyfold since 1870

Per capita GDP in 1985 purchasing power parity dollars [1]



Source: Lant Pritchett, 1995, "Divergence, Big Time," World Bank Policy Research Working Paper No. 1522.

[1] Expressed in logarithms.

Divergence present

Divergence is not confined to the past century. For relative income levels to converge, poor countries must grow faster than rich countries. Between 1960 and 1990, income grew, on average, 2.6 percent per year in the Organization for Economic Cooperation and Development (OECD) countries, and 1.8 percent in other countries. Among the poor countries, 43 percent have grown more slowly than the slowest-growing OECD country, and 70 percent have grown at a slower rate than the median for OECD countries. Since poor countries are growing more slowly on average, the dispersion in incomes among countries (as measured by the standard deviation—the dispersion of observations around an average measure—of the natural logarithm of per capita income) between 1960 and 1990 increased by 28 percent (from 0.86 to 1.1) and the ratio of the incomes of the richest to the poorest countries rose by 45 percent just since 1960.

Especially given the recent record of developing countries, it is very difficult to understand an upsurge of interest in convergence. During the Great Depression of the 1930s, income fell by 32 percent in the United States and by 19 percent in France, two of the hardest-hit industrial countries. Since 1960, more than 60 percent of the developing countries have experienced at least one episode during which incomes fell more than the decline recorded in France, and almost one-third of developing countries have suffered an episode of income reduction larger than that which occurred in the United States. Moreover, in many developing countries, the decline in income has not been reversed. Estimates of income in 1990 show that 72 percent of developing countries still fell short of their own peak income level and two-thirds were not within 5 percent of their peak. In discussions about developing countries, it is not surprising that the 1980s are often referred to as the "lost" decade, but never as the "convergence" decade.

Divergence future?

What would happen if current growth rates in developing and industrial countries were to persist? How quickly would developing countries overtake the United States in per capita income? Using the data for the 93 developing countries for which the *World Development Report 1995* reports income growth rates for 1980–93, we calculated how long it would take various countries to achieve three levels of income: their own peak income level; the current income level of high-income countries; and the average future income of high-income countries, assuming that high-income countries also continue to grow.

First, more than half of the developing countries had negative growth during 1980–93. These countries are not gaining on anything—their incomes are converging only on the floor of subsistence. Unless their growth rates accelerate, they will never reach even their previous peaks. (The reported data are, if anything, optimistic about the number of countries with negative growth, as many of the countries that do not report data fail to do so because of internal and external strife.)

Second, many developing countries had positive growth rates during 1980–93, but in more than four-fifths of these countries growth rates were still lower than the average (2.2 percent) registered by the high-income countries. Moreover, many developing countries grew slowly after suffering recessions during the 1980s. Against this admittedly pessimistic background and assuming unchanged growth rates, if Brazil, for example, were to grow annually only at its 1980–93 pace of 0.3 percent, it would take 33 years for the country to regain its own previous income peak, and

487 years before it achieved the current income level of the high-income countries.

Third, a few developing countries were actually "converging," that is, they were growing faster than the United States. When are these lucky "convergers" going to overtake the United States? India, for example, registered an annual average growth rate of 3 percent between 1980 and 1993. If India could sustain this pace for another 100 years, its income would reach the level of high-income countries today. And, if India can sustain this growth differential for 377 years, my great-great-great-great-great-great-great-great-great-great-great-great grandchildren will be alive to see India's income level "converge."

Fourth, since 1980 only 10 developing countries have had growth rates that were more than 1 percentage point higher than the average for high-income countries. These countries can be said to be converging rapidly to high-income country levels. If they can maintain this pace, these countries can look forward to attaining today's level of income in high-income countries within a couple of generations (50 years in the case of Indonesia), and they would actually reach the future income level of the high-income countries in less than a century.

Does convergence ever occur?

Of course, what will happen "if current trends persist" is not really a prediction of the future. First, the 1980s were an exceptionally bad decade and things may get somewhat better for poor countries because of improved global conditions. Second, the future will be determined by policy actions taken today, and there is no iron law that dictates divergence. Convergence can happen. There are several instances of absolute income convergence among deeply integrated economies and there are examples of very rapid growth among countries that were quite poor.

The best-documented examples of absolute convergence are those of economies that have achieved deep integration. This includes regions within nations (particularly in Europe, Japan, and the United States), the European Union countries—which have experienced absolute convergence—and, perhaps, all OECD countries, as the European countries as a group have made some gains on the United States in the postwar period.

Even where deep integration has been achieved, three points can be made. First, by any absolute standard, the rate of convergence within Europe, Japan, and the United States has been slow. Robert Barro and Xavier Sala-i-Martin (1995) have argued that within these countries, regional convergence occurs at a near-uniform rate of about 2 percent per year, meaning that only 2 percent of the income gap is eliminated each year. Second, the integration needed to achieve even that slow pace may well be very deep. In the United States, for instance, in any given five-year period, 10 percent of the population moves across state borders.

Some countries do not show regional convergence. For instance, the data presented in "Regional Economic Growth and Convergence in India," by Paul Cashin and Ratna Sahay, *Finance & Development*, March 1996, show substantial absolute divergence among the states of India, with the dispersion of the logarithm of incomes increasing from 0.29 to 0.33. In another example, China, the evidence for income convergence is mixed, but certainly does not show any uniform tendency toward absolute convergence over time.

Third, the mechanisms that lead to regional convergence may not be applicable to countries. In the United States, for example, from 1930 to 1970, there is evidence of convergence because states like California had high initial incomes and low per capita growth, while states like Mississippi had low initial incomes and high per capita growth. However, one should not ignore the fact that population growth in California was 10 times higher than in Mississippi and hence the growth of absolute (not per capita) output in California was substantially higher than in Mississippi. No one really thinks that California's economy was outperformed by Mississippi's.

A second type of absolute convergence obviously occurs when countries that start out behind experience truly rapid growth. That a country has to be behind to gain on the leader has led economists from Hume to Gershenkron to expect that poor countries would gain on the leaders. But can doesn't mean will.

What can we learn from the examples of Japan and Korea and, most recently, China? If anything, they demonstrate the possibility of "policy-conditional" conditional convergence. That is, if a country's initial income is low and its government pursues growth-oriented policies, then very rapid growth rates may be possible. Jeffrey Sachs and Andrew Warner (1995), for instance, have recently suggested that countries that adopted such policies did in fact exhibit very strong conditional convergence, while those poor countries that did not adopt them did not display any conditional convergence. However, it is important to note that only 12 developing countries, using their criteria, did adopt growth-oriented policies. This suggests that the likelihood of having good policies was lower the poorer a country might be, and that this strong "policy-conditional" conditional convergence is compatible with absolute divergence and very weak "unconditional" conditional convergence.

Why focus on convergence?

If the divergence of incomes is obvious in past and present data, and is a worrisome possibility for the future, why has convergence received so much attention?

The first good reason that convergence is in the news is that even though a large number of poor countries may be falling behind, the two largest countries—China and India—have been doing well. The population-weighted average of income growth over 1980–93 for all poor countries is 3.7 percent, but when China and India are excluded, that average falls to 0.1 percent. Obviously, the fact that the world's most populous country is also its most rapidly growing has significant implications for both rich and poor countries. But these implications are specific to China—they are not an example of a more generalized experience of convergence.

The second good reason for the attention to convergence is its importance for the resurgent economic literature on models of economic growth. Many economists argue that a critical empirical hypothesis for distinguishing a new generation of endogenous growth models that predict steady state differences in growth rates from the older Solow/Swann neoclassical models (augmented for human capital) is whether or not there is conditional convergence. But both types of growth models are capable of predicting absolute divergence in per capita incomes (as they, of course, must to retain even surface plausibility). Whatever its theoretical importance for growth models, the debate boils down to whether the observed absolute income divergence is attributed either to nondiverging fundamentals that cause permanent differences in growth (endogenous) or to conditional convergence to divergent levels of income (exogenous).

Unfortunately, convergence has also received attention because many people have misunderstood the concept of conditional convergence. In this context, "conditional" has a very specific econometric meaning. Conditioning in this technical sense means extracting from the differences in actual growth rates across countries the

effects of other variables, particularly investment in physical and human capital. Thus, while growth rates are higher among the rich countries, growth rates conditional on variables like the initial level of schooling and rate of investment are lower. But since initial schooling and investment rates are themselves higher in the rich countries, this "conditional" convergence is perfectly compatible with continued absolute divergence.

An example might be instructive. Suppose we tried to explain people's weight gain with a model in which weight gains or losses are predicted based on one's weight last year and one's height. If an individual's weight fluctuates around a more or less stable level that depends on height, then one will find convergence of weight, conditional on height. People who are thinner than their long-term average will, on average, gain weight and those heavier will, on average, lose weight. This does not imply that over time everyone will weigh the same. The distribution of weight across individuals will remain exactly the same, irrespective of the speed of "conditional" weight convergence.

There are other, not so good, reasons for attention to convergence in the richer countries. First, since horse race metaphors of economic competition dominate the thinking of policymakers, they tend to worry only about the horse just behind them, not about what is happening at the back of the pack. There is no question that Germany and Japan have gained on the United States in the postwar period, but this has nothing to do with the prospects for poor countries. Second, there is a near-universal tendency to give more political attention to domestic jobs lost to imports than either to jobs that are lost to export jobs forgone or even to jobs gained from exports. The import-competing jobs "lost" to Korean imports, for example, are politically more visible than the export jobs "lost" to the collapse of investment in Latin America in the 1980s.

Conclusion

There are three good reasons not to worry about convergence. First, it just hasn't happened, isn't happening, and isn't going to happen without serious changes in economic policies in developing countries. Second, casual talk of "convergence" conveys the wrong impression; there is nothing automatic or easy about economic development. Rapid growth is not the result of being poor—it is the result of creating a set of policies that facilitate rapid growth. The policy environment that developing countries need to establish rapid growth and development is difficult to achieve, as is evidenced by the fact that so few have done so, and there is no "advantage to backwardness" in this endeavor. Third, talk of convergence, especially in the industrial countries, implies that their real concern is to protect themselves from the "converging" poor countries when exactly the opposite is the case. Given the facts, more, not less, concern for the promotion of economic development and acceleration of growth in poor countries is in order. F&D

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