

Commentary: The Search for Growth

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For evaluating economic well-being, the single most important statistic about an economy is its income per capita. Income per capita measures how much the typical citizen receives for his contribution to economic activity. And it measures the flow of resources available for current consumption or for investment in the future.

Despite all our problems, the United States continues to be blessed with a high level of income per capita. U.S. income per capita is 1.5 times England's, 4.5 times Argentina's, and **23** times India's. The United States and Japan are so close in income per capita that the comparison becomes difficult, but by most measures, the standard of living in the United States is still higher.

Yet, another way of looking at the data is less encouraging. Many countries are growing faster than we are. Over the past 30 years, income per capita rose by 5.1 percent per year in Japan and 2.5 percent in Germany, but by only 2.1 percent in the United States. Of the 24 countries in the Organization for Economic Cooperation and Development (OECD), only three grew more slowly than the United States.

So the United States is richer than most countries, but many countries are growing faster. Obviously, if the United States continues to grow more slowly than the rest of the world, it will eventually lose its status as the economic frontrunner. And, if history is any guide, it risks losing its role as a military and political superpower as well.

What determines whether a country grows rapidly like Japan, or slowly like the United States? How should economists model the process of economic growth? How can policymakers encourage faster growth? These are the questions that theorists of economic growth try to answer. In his paper, Charles Plosser surveys some of the prominent theories. He considers traditional theories of economic growth, as derived from the early work of Robert Solow, and endogenous growth theories, which have attracted much interest during the past decade.

Although I agree with most of Plosser's assessments, I would put a different "spin" on the conclusion. Rather than saying that we need new theories of economic growth, I would suggest that we merely need to reinterpret traditional theories.

Plosser correctly points out that traditional growth theory, such as Solow's, emphasizes the accumulation of capital. The usefulness of the theory is, therefore, limited to capital's importance in the production process. In assessing traditional growth theory, the key question is, how important is capital accumulation to production and growth?

To answer this question, Solow's theory points us toward a specific number: the share of national income earned by capital. The capital share has two roles in Solow's theory. First, the larger the capital share, the more important are rates of investment in explaining international differences in steady-state income. Second, the larger the capital share, the longer is the time horizon over which an increase in investment will stimulate economic growth.

So how large is the capital share? According to the national income accounts, capital receives only one-third of gross income. If this fact is plugged back into Solow's theory, we learn that capital accumulation cannot easily explain the large international differences that we observe. One-third is simply not a large enough capital share to make capital accumulation the key to understanding economic growth.

Economists differ in how they react to this conclusion. A common reaction is to discard Solow's theory and replace it with some newer, fancier theory. By contrast, my reaction is less radical. Perhaps Solow's theory is right, but the fact is wrong. Perhaps capital actually

receives much more than one-third of income.

There are two ways to argue that the capital share is larger than one-third. One argument is that there are positive externalities to capital. That is, some of the benefits to capital accumulation may accrue not to the owners of capital but to others in society. This would occur if, for example, new ideas arise as capital is built and these ideas enter the general pool of knowledge. In this case, even if capital receives only one-third of income, in some sense it deserves credit for more than one-third. How much extra credit is hard to judge.

A second argument for a larger capital share is that capital is a much broader concept than is suggested by the national income accounts. In the national income accounts, capital income includes only the income of physical capital, such as plant and equipment. More generally, we accumulate capital whenever we forgo consumption today in order to produce more income tomorrow. Surely, one of the most important forms of capital accumulation is schooling. Yet the return to this human capital is not part of capital income in the national income accounts; instead, it is part of labor income. Therefore, the accounts substantially underestimate the capital share of income.

To gauge the true capital share, we need to decide how much of labor income should be credited to human capital. To do this, we might look at the minimum wage, which is roughly the return to labor with minimal human capital. The minimum wage today is roughly one-third of the average wage. This fact suggests that the return to human capital is about two-thirds of labor income, or almost half of national income.

Another way to estimate the human-capital share of income is to look at the return to schooling. A large literature in labor economics finds that each year of schooling raises a worker's wage by about 8 percent. Moreover, the average American has about 13 years of schooling. Together these facts imply that the average worker earns almost three times as much as he would without any human capital. In other words, about two-thirds of the average worker's earnings is the return to his education. Again, this suggests that the human-capital share of national income is almost one-half.

If we add this estimate of the human-capital share to the physical-capital share of one-third, we find that the income from all forms of capital equals about 80 percent of national income. This increase in the capital share from its traditional value of one-third to this new value of four-fifths is crucial for how we evaluate theories of economic growth. This new higher capital share implies that traditional growth theory, with its emphasis on capital accumulation, can explain the huge international differences in income per capita that we observe. And it implies that high saving and investment can lead to high growth over a horizon of many decades.

Let me now turn to the key question for policymakers: How can a country achieve a high rate of economic growth? The Solow growth model, interpreted broadly to include human capital, suggests that there are four secrets to fast growth.

Secret to growth #1: Start behind.

As Plosser points out, the Solow growth model implies convergence in standards of living. That is, holding other things constant, countries that start off poor will tend to grow faster than countries that start off rich.

This prediction of the theory explains much of the slow U.S. growth during the past 30 years. Many countries have grown more quickly than the United States simply because they started so far behind. Germany grew quickly in the period after World War II because it was making up for the destruction of the war. Japan had to catch up not only from the war, but also from its low state of development before the war. In 1950, income per capita in Japan was only one-sixth of income in the United States. Now that these countries are approaching the level of income in the United States, their growth rates have fallen and are closer to ours.

Secret to growth #2: Save and invest.

Individuals build their wealth by consuming less than their income and investing the difference. Nations are no different. The more a nation saves and invests, the more capital its workers have to work

with, and the greater are their productivity and wages.

This simple lesson does not bode well for the United States. During the 1980s, gross national saving in the United States averaged about 18 percent of GNP, compared to 31 percent for Japan. So not all of Japan's fast growth has been catch-up; part of it has come from greater thriftiness.

This comparison leads many to advocate policies to raise national saving. One way would be to stimulate private saving through tax incentives, such as a switch from income taxation to consumption taxation. Another way would be to raise public saving—that is, to reduce the government budget deficit that represents *negative* saving for the nation.

Secret to growth #3: Educate the young.

As with physical capital, building human capital requires a sacrifice today in order to reap a benefit in the future. When we spend money on schools and teachers, that money is unavailable for current consumption. Students who are building human capital must forgo the wages they would have earned if they were in the labor force.

Fortunately, U.S. investment in human capital is not as meager as U.S. investment in physical capital. An impressive 60 percent of our students continue their education beyond high school, as compared to 30 percent in Japan and Germany. Yet many countries do a better job of educating the students that they do have in school. The typical Japanese high school student spends 240 days per year in school, compared to 180 days for the typical American student.

Secret to growth #4: Keep population growth low.

When the population of a country grows rapidly, it is more difficult to provide new workers with the tools and skills needed for production. In other words, rapid population growth depresses the amount of physical and human capital available for each worker, which in turn, reduces each worker's productivity.

Rapid population growth is not a problem for the United States, but it is a primary cause of poverty in the Third World. Over the past several decades, the U.S. population has been growing at about 1.2 percent per year, which means that the population doubles every 58 years. By contrast, the typical country in sub-Saharan Africa has a population growth rate of 2.8 percent per year, so the population doubles every 25 years. Not surprisingly, African productivity lags far behind the rest of the world.

So there are the four secrets of economic growth. These secrets come from the most basic Solow growth theory, and they are consistent with the international evidence.

One nagging question remains: If the secrets of growth are as simple as I have suggested, why does the United States have such a low growth rate? Why don't we pursue policies to raise the growth rate? To some extent, the failure of American economic policy to promote growth may reflect a genuine confusion about how rapid growth is best achieved. But one can also take a darker view of the situation: If capital accumulation is the key to growth, then prosperity tomorrow requires sacrifice today. It is a rare politician who is willing to be the bearer of such a difficult truth.

Endnote

¹Professor Mankiw's remarks are based on his joint work with David Romer and David Weil. See N. Gregory Mankiw, David Romer, and David Weil, "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics*, (May 1992), pp. 407-37.