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The Sources of the Growth Slowdown

Since the mid-1970s, the growth rate of the U.S. economy has slowed. Between 1962 and 1974, real GDP increased at an average annual rate of 3.7 percent, whereas in the following ten years growth averaged only 2.6 percent. Since 1985 annual growth has slowed further to an average of only 2 percent, although this partly reflects the effects of the recent recession.

It is often suggested that this slowing in growth may be traced to the decline in the private saving rate since the mid-1970s. Indeed, proposals to alter the tax system to stimulate private saving often are justified on the ground that this would enhance future economic growth. Although the decline in private saving has been partially offset by an inflow of foreign saving, it has also been coupled with the emergence of a large federal deficit. Together these developments may have reduced the pace of capital accumulation by decreasing the supply of investment funds.

Neoclassical economic growth theory (Solow 1956) argues that the supply of saving in an economy is a key determinant of the equilibrium stock of capital and hence influences the productivity of its labor force. A permanent decline in the supply of saving means that the economy must adjust toward a lower stock of capital per worker and thus to lower output per worker. During the transition to this new equilibrium, which may last several decades, output growth will slow. Although the growth rate will pick up again once the adjustment is complete, the levels of labor productivity and hence output will be permanently lower than they would otherwise have been.

Some economists—the proponents of so-called “endogenous growth theory”—suggest that the effects of a decrease in the supply of savings may result not only in *temporary* slow growth, but also in a *permanent* slowdown. These economists argue that the level of investment affects the pace of technological progress and the accumulation of knowledge, so that a lower level of saving and investment slows the rate of technical change. Hence decreased saving not only reduces the *quantity* of capital that workers have to

work with, but also causes its *quality* to increase less rapidly.

An explanation of the growth slowdown along these lines would carry more weight if the accumulation of tangible capital were quantitatively the principal source of growth in the economy. However, the explanation would be less convincing if most growth were due, for example, to exogenous increases in the quantity or quality of the labor force.

In this *Weekly Letter*, I examine the broad sources of long-run growth between 1962 and 1985 in five industrial countries: the U.S., France, Germany, Japan, and the United Kingdom. (Internationally comparable data on stocks of capital are not available for more recent years; data for Japan refer only to 1965–1985.) Three facts stand out. First, GDP growth slowed in all five countries after the mid-1970s. Second, the relative contribution of capital accumulation to growth was smaller and that of labor force growth was significantly greater in the U.S. than in the other countries. Third, the contribution of capital accumulation to growth was less in all countries after 1975 than before. But the reduced contribution of capital growth has been relatively less significant in the U.S. than in other countries. Thus, while it does not appear to be true that much of the slowdown in U.S. growth has been associated with a slower pace of capital accumulation, the U.S. is by no means unique among advanced countries.

Measuring the sources of economic growth

Broadly speaking, increases in an economy's output may be attributed either to growth in the available supply of factors of production in the form of labor and capital or to improvements in the effectiveness with which these resources are used. The contribution of each factor of production to the increase in GDP may be measured by its growth multiplied by its marginal product. If, for example, the marginal product of a machine is \$15 per hour and that of a worker is \$5 per hour, then employing two more machines with four more workers for an hour will raise GDP by \$50,

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of which \$30 may be attributed to the two added machines and \$20 to the four added workers.

Data are available on the supplies of labor and capital in most advanced countries, but measuring their marginal products is difficult. The usual approach is to assume that the economy is competitive and exhibits constant returns to scale, which implies that factors of production are paid incomes that depend on their marginal products. With these assumptions, we can use data on wage and nonwage incomes to estimate the marginal products of labor and capital, and therefore measure each factor's contribution to the economy's growth rate by multiplying its growth rate by the share of the total national income that accrues to it. In most countries, the shares of national income received by labor and capital have been relatively stable over time.

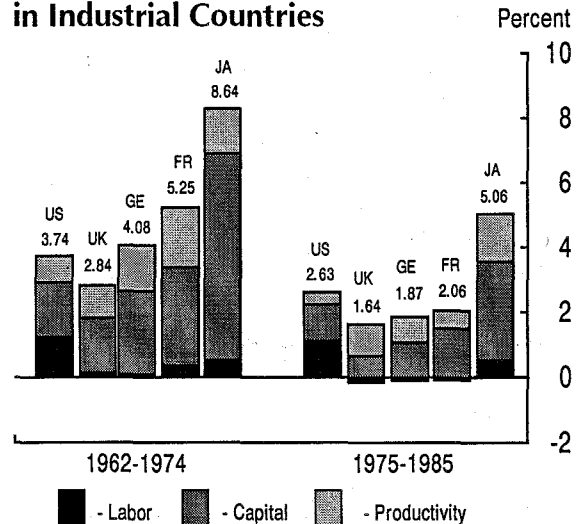
The combined contributions of labor and capital do not account for all of measured GDP growth. The remainder represents the contribution of advances in technology and education that add to the productivity of either labor or capital. This contribution is described either as "multifactor productivity" or, less formally, as the "Solow residual," after Robert Solow who developed this technique (Solow 1957). In the data shown in the chart discussed below, the effects of changes in average hours of work are included in multifactor productivity, but these are relatively small. However, because it is calculated as a residual, multifactor productivity also includes errors of measurement both in the stocks of labor and capital and their marginal products (the inputs to production) and in GDP (the output).

Why has growth slowed?

The chart compares the average growth rates of real GDP in the five countries in 1962-1974 and 1975-1985. Growth slowed in all five countries, suggesting that the U.S. slowdown was not due to factors unique to the U.S. Indeed, the slowing was relatively less severe in the U.S. with average annual growth decreasing from 3.74 to 2.63 percent. As a result, there was some convergence between national growth rates, and the U.S. ranking improved from fourth to second among the five countries. Only Japan experienced stronger average growth between 1975 and 1985.

The chart also shows the sources of growth between 1962 and 1985. These measures were constructed from data on national product, em-

Sources of Economic Growth in Industrial Countries



ployment, and the capital stock (OECD 1983, 1987). In all countries except the U.S., growth in the supply of labor made only a negligible contribution to economic growth. Indeed, in the three European countries, the labor supply actually made a negative contribution between 1975 and 1985. In the U.S., by contrast, about one-third of the growth in output was attributable to increases in the supply of labor. Moreover, the contribution of labor to economic growth was about the same in the earlier and later periods. Employment growth contributed 1.2 percentage points to GDP growth between 1962 and 1974 and 1.1 percentage points between 1975 and 1985. Thus, the slowdown in GDP growth in the later period was not due to slower growth in the contribution of labor.

Growth in the stock of capital played a larger role in economic growth abroad than in the U.S. In Japan, for example, real GDP growth averaged 6.6 percent annually over the whole period, and growth in the stock of capital contributed 4.7 percentage points. In all four foreign countries, capital growth was responsible for more than half the total growth, compared to only 45 percent in the U.S. Growth in multifactor productivity was a relatively more important contributor to growth in the three European countries than in either the U.S. or Japan. However, economists frequently refer to multifactor productivity as "the measure of our ignorance," since it refers to that portion of overall growth that is not "explained" by growth in the supplies of labor and capital. Hence, it is

difficult to draw conclusions from differences in the contribution of this factor, especially since any errors in the calculations show up here.

In all five countries, only a minor part of the slowing in growth after the mid-1970s was due to slower growth in employment. The largest effect was in France, where slower growth in labor input during the 1975–1985 period cut 0.4 percentage point off annual GDP growth. In all countries, the largest source of the slowdown was reduced growth in capital. Reflecting the larger contribution of capital to growth in foreign economies, it also played a greater role in the slowdown in those countries. In Japan, for example, the contribution of capital to growth declined from 6.4 percentage points in 1965–1974 to 3.1 percentage points in 1975–1985. Slower capital growth was less of a factor in the U.S., with its contribution decreasing from 1.7 percentage points to 1.2 percentage points.

Conclusions

What should we conclude from this brief look at the sources of growth in the U.S. and abroad? First, the high productivity and steady growth of the U.S. work force have played a major role in economic growth. This is an interesting finding in an era where the popular media often deride U.S. workers, comparing them unfavorably with foreign workers. Second, the accumulation of capital has contributed less to recent GDP growth in the U.S. than in other countries, but the slowing in capital's contribution to growth since 1975 has been more dramatic abroad. The lower level of investment relative to GDP in the U.S. may reflect the larger stock of capital per worker that has already been accumulated in the U.S. The fact that the U.S. did not suffer the devastation of capital that occurred in World War II probably explains both the larger contribution of capital to growth in foreign countries prior to 1975 and the sharper slowdown since then.

The slowing in growth associated with reduced capital formation since the mid-1970s has been less severe in the U.S. than in other countries. This suggests that the high rates of growth and capital formation that other countries experi-

enced in the immediate post-war period represented a catching up process, as these countries made up for the low investment (and actual capital destruction) during the war years. Since 1974, the cross-country differences in both investment rates and GDP growth have been significantly less, which may mean that countries are closer to their long-run equilibria.

The benefits from raising the capital-labor ratio by increased saving do vary between countries. Most economists argue that increases in the stock of capital relative to labor produce diminishing returns, which implies that increases in saving may be less productive in countries where the stock of capital already is substantial. Also, although a larger stock of capital makes it possible to produce more output per worker, not all of this added product is available to raise living standards. This is because a larger stock of capital also means that a bigger share of current output must be devoted to maintaining and replacing worn-out capital and so is not available for consumption. Nonetheless, it seems clear that even for countries like the U.S. that have already accumulated a large capital stock, further increases in the capital-labor ratio would pay off in the form of higher consumption for future generations. But this does require more saving by the present generation. Higher future living standards are not a free lunch!

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