

# FRBSF WEEKLY LETTER

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## Are World Incomes Converging?

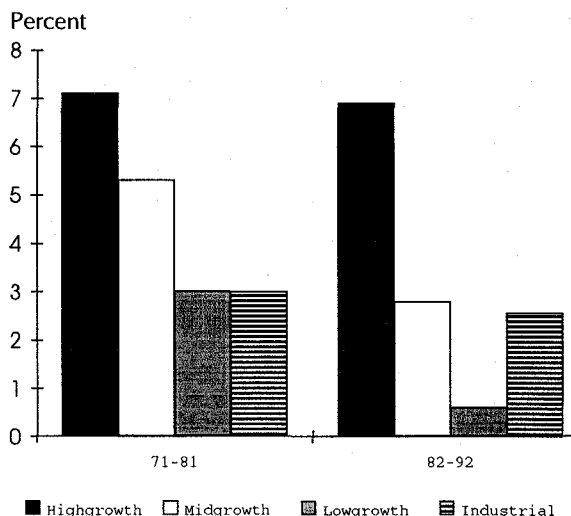
According to traditional theories of economic growth, incomes in developing countries should eventually catch up to those in industrial countries. The reason is that since capital is scarce in developing countries, capital will be more productive there, or rates of return on investment will be higher, than in industrial countries. To the extent higher rates of return spur greater capital investment and growth, income differences between developing and industrial countries should narrow. However, excepting a group of rapidly growing developing economies, the prediction of convergence has generally not been fulfilled. This *Weekly Letter* examines the issue of convergence by reviewing differences in growth performance among developing countries, and discussing the characteristics of high growth economies that may account for their relatively better performance.

### Growth performance

Figure 1 compares real GDP growth for high-growth, middle-growth, and low-growth developing economies over two periods, 1971–1981 and 1982–1992. The growth classifications are from the International Monetary Fund (1993). Ninety countries are covered, with the “high-growth” group consisting of the top third, and so on. The growth rates in each category are weighted averages, with weights based on 1981–1984 purchasing power parity valuation of country GDPs. Many East Asian countries are in the high-growth category; African economies, notably in the drought-stricken sub-Saharan region, figure prominently among the low-growth countries. For reference, the figure also shows the growth rate of industrial countries.

Figure 1 shows that growth rates in the high-growth group consistently exceed those of the industrial countries. As a result, the gap between the incomes of the high-growth group and of the industrial countries has narrowed significantly since 1971. In contrast, incomes of the middle-growth countries were converging to those of the industrial economies in the 1970s, but convergence stalled in the 1980s. As for the low-growth countries, their performance was so poor that the gap between their GDPs and those of industrial countries widened between 1971 and 1992.

Figure 1: Real GDP Growth



### Investment and savings

Traditional growth models relate economic growth to factors of production, such as capital and labor, as well as productivity. One implication of these models is that developing economies will grow faster because of higher rates of capital investment. Indeed, Levine and Renelt, 1992, find that the relationship between investment shares and growth rates is robust under many econometric specifications.

Figure 2 illustrates the share of investment and saving relative to output in the three groups of developing economies. Two features of the data stand out: (i) over the past two decades, on average the shares of investment and saving are higher in the high-growth economies; (ii) both investment and savings shares remained high in the high-growth economies across time, but in the middle-growth and low-growth countries, investment and saving shares fell in the 1982–1992 period. One plausible interpretation of Figure 2 is that high rates of investment require high rates of saving.

In theory, high rates of domestic saving are not needed to finance investment if foreign capital (in the form of lending or direct investment) is

available. In practice, however, foreign capital often is not available to low-income economies. In some cases, the environment for foreign investors has not been hospitable; in other cases foreign investors have been deterred by the difficulties in repatriating profits or in securing repayments on external debts. This was particularly true after 1982, when the international debt crisis led to cutbacks in international financing for middle- and low-growth economies. Such cutbacks in turn caused the decline in their investment shares after 1982.

The reasons why high-growth economies save a lot are not fully understood. However, observation of the high-growth economies in East Asia suggests that countries with high national savings adopted stable macroeconomic policies, and in particular avoided incurring large government budget deficits. These stable macroeconomic policies may have raised the expected return on investment and reduced the perceived risk of such investment.

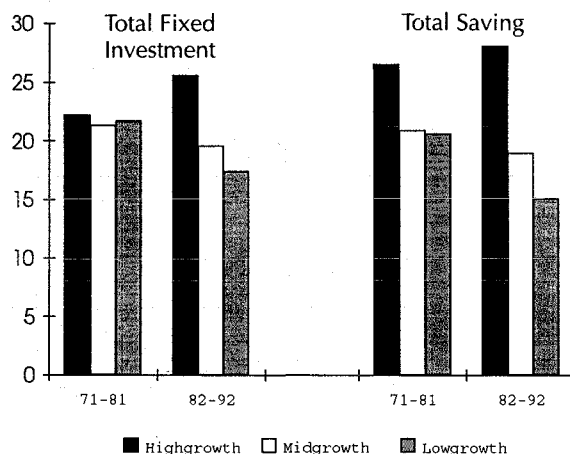
### Productivity and exports

As Figure 2 illustrates, while all three groups of developing countries had rates of investment around 21 percent of GDP in the 1970s, real GDP growth in the high-growth economies significantly outstripped growth in the other economies. This suggests that growth depends on more than investment. Productivity improvements are another important ingredient.

To shed some light on the role of productivity, the left side of Figure 3 reports the contribution of total factor productivity to output growth using a growth-accounting framework (IMF, 1993) over the period 1971–1991. Total factor productivity is measured by the residual portion of trend output growth that is not explained by increases in factors of production (labor and capital). The contribution of total factor productivity to growth in the high growth economies was (i) much larger than in the other developing economies and (ii) stable over the two subperiods. In contrast, the growth in total factor productivity fell sharply in the middle-growth economies and turned negative in the low-growth economies after 1982.

Some of the earlier growth models provide little insight on the sources of productivity growth, but recent research has made some progress in improving our understanding. In a lucid essay,

**Figure 2: Investment and Saving as a Percent of GDP**

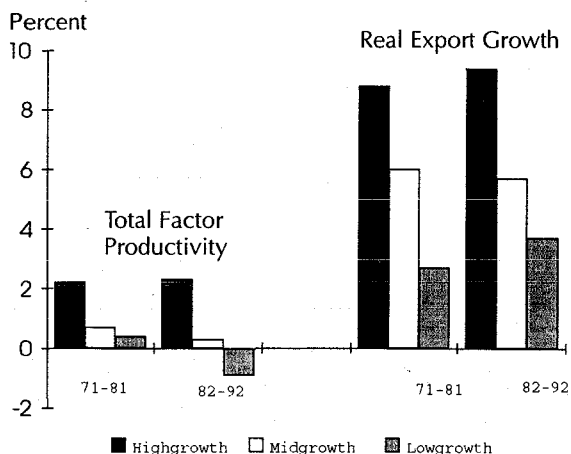


Robert Lucas (1993) discusses new models where the accumulation of human capital or knowledge is the main engine of growth and productivity increases. Such accumulation occurs in a number of ways, but largely through learning on the job. Lucas illustrates how such learning affects productivity by citing the production of Liberty ships during World War II. As shipyards acquired experience, industry output per man hour increased at a 40 percent annual rate over a three-year-period. In any given industry, such remarkable productivity gains will level off after a while. However, the greater productivity (through learning) acquired in making a product may make it profitable to invest in making new, perhaps more sophisticated, products. Such investment might not have been profitable if workers had been less productive. Thus, experience in a given industry may provide the basis for entering new industries where productivity gains will again be substantial as the new production processes are mastered. In this manner, a high-growth economy may exhibit very large and sustained productivity gains as its workers and firms continuously enter new lines of production.

Lucas conjectures that productivity growth is more rapid in high-growth economies because these economies succeed in continuously moving the work force from less to more sophisticated products. These economies rapidly accumulate human capital "through the high learning rates associated with new activities, and through the spillover of this experience to the production of still newer goods" (page 267).

While more work is needed to develop and test Lucas's conjecture, the data on exports appear to support it. Since the continuous movement into

**Figure 3: Total Factor Productivity and Real Export Growth**



new product lines is likely to require large markets, and since domestic markets in many high-growth economies are small, Lucas's framework implies that high-growth economies should experience very rapid rates of export growth. This high growth in exports is apparent in the right hand side of Figure 3.

Also, the composition of exports should shift to more sophisticated (manufactured) products. Indeed, rapid export growth in the high-growth economies was accompanied by significant increases in the share of manufactured goods in total nonfuel exports. For example, in East Asia and the Pacific, this share rose from 33 percent to 72 percent between 1970 and 1991. In addition, the types of manufactured goods produced by high-growth economies have changed over time, from labor-intensive goods requiring relatively little technological know-how, to capital-intensive or knowledge-intensive goods. Since the growth in exports depends on the human capital already accumulated through past export production, this framework also helps explain why exports in high-growth economies consistently grew more rapidly than in other developing economies.

The experiences of the East Asian economies also clarify what policies will foster competitive exporters. Countries with high trade barriers tend to be poor exporters, because producers have an

incentive to produce for the protected domestic market and because trade barriers raise the cost of inputs that might be used for exports. Successful economies have avoided these adverse effects by (i) eliminating trade barriers (Hong Kong and Singapore, for example, or (ii) shielding the export sector from the effects of trade barriers through subsidies or other means (Taiwan and Korea, for example). Of these two approaches, eliminating trade barriers is preferable. One reason is that the use of export subsidies can be costly, as unsuccessful industries may be subsidized. Another reason is that in today's international trading environment, the use of export subsidies is likely to be unacceptable to trading partners.

### Conclusions

Our review of the experiences of developing countries over the past two decades suggest that the incomes of high-growth developing economies have tended to converge to those of industrial economies because of (i) high rates of investment that appear to depend on high rates of domestic saving; and (ii) rapid productivity growth that appears to reflect the learning effects resulting from fast export growth, and significant changes in the composition of such exports. Countries wishing to grow rapidly should therefore exercise fiscal restraint in order to promote high rates of national savings, which will in turn support investment. They should also eliminate trade barriers, so as to develop a competitive export sector that will stimulate learning on-the-job and human capital accumulation.

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