

BY ROBERT J. BARRO

## THE EAST ASIAN TIGERS HAVE PLENTY TO ROAR ABOUT



**FLAWED:** Earlier studies suggested that the region's growth came mainly from a capital surge. Technology had a lot to do with it, too

Until last year, many East Asian countries were widely regarded as economic miracles. The standouts included the four Asian Tigers—Hong Kong, Singapore, South Korea, and Taiwan—where growth rates of real per capita gross domestic product from 1960 to 1995 were around 6% per year. Right behind were Indonesia, Malaysia, Thailand, and China. These performances placed this East Asian group at the top of the world's growth list.

The Asian reputation has suffered recently because of financial crises and recessions. These crises did highlight some policy shortcomings, such as unwise credit subsidies and deficient regulation of financial markets. But the negative reaction has been sharply overdone. In comparison with typical developing countries, government policies in most of the East Asian countries have been fiscally responsible, pro-market, and, hence, reasonable.

Yet even before the recent setbacks, the four Tigers' economic record was challenged in two well-known studies by Alwyn Young (in the 1992 *NBER Macroeconomic Annual* and the 1995 *Quarterly Journal of Economics*). Young argued that the high rates of economic growth reflected very little technological progress. Growth occurred mainly because of extraordinary rates of capital accumulation, some in the form of education ("human capital"), but most in machines and buildings. The lack of technological progress was surprising because, even if these countries were inventing little, they should have been benefiting from the superior techniques they were imitating from the world's most advanced countries. Historically, long-term economic growth has been sustained by significant increases in productivity due to technological and organizational change. The accumulation of huge amounts of capital and labor can work for a time, but ultimately must be backed by improvements in technology.

In Singapore, Young's analysis suggests that rapid growth was supported almost entirely by physical and human capital accumulation. In fact, investment was so high that the rate of measured productivity growth was actually negative. To Young, the high rate of investment persisted only because of the government's policies of forced saving and implicit subsidies to foreign capital.

The Young thesis was popularized and misinterpreted by economic journalists who even

compared some Asian economic policies to the high-investment programs of Stalin's Soviet Union. This argument never made sense, because the Soviet Union's output was valued at artificial prices made up by government bureaucrats. When realistic prices were applied in the post-communist 'SOS, the measured level of per capita output turned out to be low. In contrast, for the Tigers, most output is valued at world market prices, and there is no reason to think that growth is overstated.

**SINGAPORE SWING.** A recent study by Chang-Tai Hsieh published by the University of California at Berkeley challenges key parts of Young's conclusions on productivity growth. The most dramatic revisions apply to Singapore, where Hsieh notes that observed rates of return on investment have been roughly stable since the mid-1970s, not declining as Young's calculations would imply. Combine that fact with Singapore's robust growth in real wages, and Hsieh shows that measured productivity growth had to be positive—an estimated 2.2% per year—rather than the -0.7% reported by Young. According to Hsieh, Young's analysis went wrong because of its reliance on Singapore's government national account statistics, which dramatically overstated the growth of the capital stock. Hsieh also found that Taiwan's productivity growth was better than previously assessed by Young (3.7% vs. 2.1%), but got less dramatic results for South Korea (1.5% vs. 1.7%) and Hong Kong (2.7% vs. 2.3%).

Even these higher estimates on productivity growth for Singapore and Taiwan understate the contribution of technological progress to economic growth. Improvements in technology raise the demand for physical capital (machines and buildings) and human capital (highly educated workers). But the resulting expansions of capital input are filtered out in the usual calculations of productivity growth. A full explanation of these countries' growth would attribute more to the contribution of technology than Young's original thesis. It is improvements in technology that explain why so much capital accumulation could have occurred, especially in Singapore, without encountering diminishing returns. Thus, overall, we continue to have ample grounds to view the East Asian growth and technological performances as miraculous.

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