

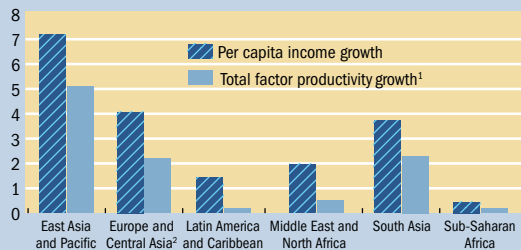
Bridging the

TECHNOLOGICAL progress—improvements in the ways that goods and services are produced, marketed, and brought to market—is at the very heart of human advancement and development. It has helped reduce the share of people living in absolute poverty in developing countries from 29 percent in 1990 to 18 percent in 2004.

Technological progress in developing countries (that is, low-income, lower-middle-income, and upper-middle-income countries) outstripped progress in high-income countries between the early 1990s and 2000s. Of course, the initial level of technology in lower-income countries was much lower to begin with.

Technological progress has gone hand in hand with income growth in developing regions.

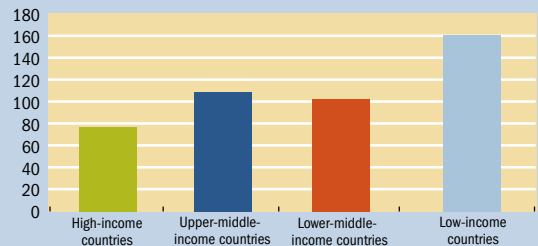
(average annual percent change, 1990–2005)



¹Total factor productivity growth summarizes all influences on GDP growth—such as technology—other than increases in capital and labor.
²Data for Europe and Central Asia cover the period 1995–2005.

In low-income countries, technological progress has been very rapid . . .

(percent change in technological achievement index, 2000s versus 1990s)¹



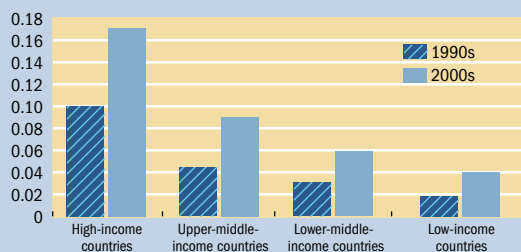
¹Aggregate measure that combines 20 separate indicators of technological achievement.

As a result, the technology gap between rich and poor countries has narrowed, although it remains wide. Low-income countries employ only one-fourth the technology used in high-income countries.

The very strong technological progress developing countries have enjoyed has come mainly from adopting and absorbing existing technologies. Compared with the size of their economies, they perform relatively little new-to-the-world innovation.

. . . but the technology gap between high-income and low-income countries remains wide.

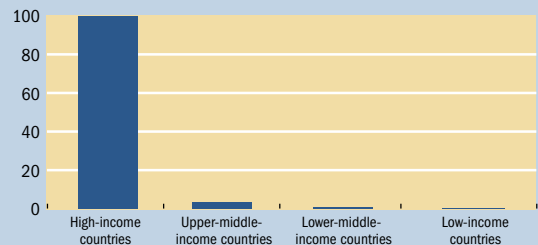
(technological achievement index)¹



¹Aggregate measure that combines 20 separate indicators of technological achievement.

Most low-income countries are barely active on the global technology frontier.

(intensity of scientific innovation and invention during 1990–2005; index, high-income countries = 100)¹



¹A subindex of the technological achievement index.

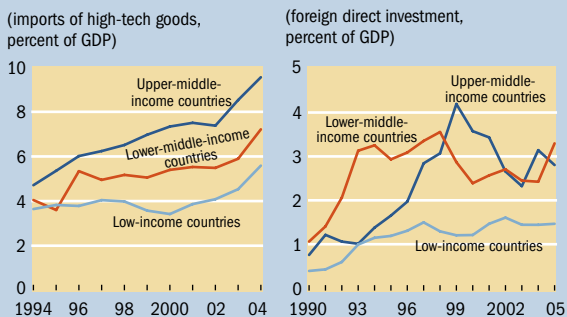
Prepared by Andrew Burns (World Bank). Based on World Bank, Global Economic Prospects 2008.

Technology Divide

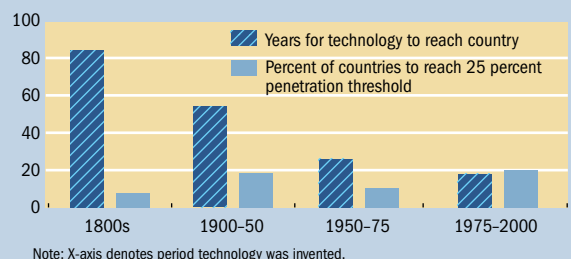
The diffusion of technology across developing countries has been facilitated by their increased exposure to foreign technologies. Over the past 15 years, foreign direct investment levels and imports of high-technology and capital goods have doubled as a percent of GDP—in part because of contacts with well-educated migrant populations living abroad.

Partly as a result of this increased exposure, newer technology—such as cell phones, computers, and the Internet—now spreads much more quickly. In the early 1900s, new technology took more than 50 years to reach most countries; today it takes about 16 years. But technology tends to spread slowly within countries because many developing countries lack the technical skills necessary to master new, or even older, technologies.

Market openness stimulates technology transfer.



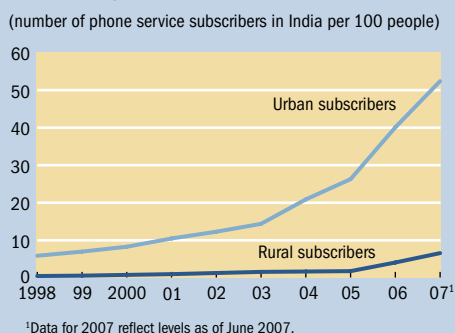
Technological diffusion across countries has picked up, but penetration within countries is weak.



Slow diffusion within countries means that, although individual cities may be technology leaders, the use of technology in a country as a whole may be low. For instance, while more than 1 in 2 urban Indian families has cell phone access, only 1 in 10 in the rural sector does.

Although better macroeconomic and educational policies, as well as the spread of older enabling technologies—such as electrical networks, road infrastructure, telephone land lines, and sanitation networks—have advanced the spread of technology in developing countries, progress has been slow and the capacity to absorb new ideas and techniques remains weak.

Low diffusion in rural areas in many countries, such as India, restrains technological achievement.



Closing the gap

To continue catching up with high-income countries, developing countries need to

- maintain exposure to foreign technologies through trade openness, foreign direct investment, and the participation of migrant populations;
- further improve the investment climate to allow innovative firms to grow;
- invest in enabling technologies and basic infrastructure, such as roads, electricity, and telephones;
- improve the quality and increase the quantity of education throughout the economy—not just in major centers; and
- emphasize technology diffusion by reinforcing dissemination systems and the market orientation of R&D programs. ■