

The background is a solid purple color. On the left side, there is a large, dark purple, rounded rectangular shape. In the center-right, the words "STATES AND MARKETS" are written in a bold, white, sans-serif font, stacked vertically. The background is also filled with faint, semi-transparent geometric patterns, including horizontal lines and stylized, overlapping letters that appear to be "STATES AND MARKETS" repeated in a lighter shade of purple.

STATES AND MARKETS

Information and communication technology for development

Rapid advances in information and communication technology (ICT) have connected people, businesses, and governments around the world, enabling knowledge sharing across cultures and countries. ICTs used in e-government projects can reduce corruption, and some ICTs, such as broadband, can contribute to economic growth (box 5a).

Good government policies and regulations are creating competitive ICT markets, increasing access to ICT services for people everywhere. Recognizing the need to analyze ICT's impact on development, many statistical offices in developing countries are beginning to conduct household and business surveys to improve their ICT policy and analysis. Information on ICT infrastructure, access, use, quality, affordability, applications, and trade are included in tables 5.10 and 5.11.

The well known success of mobile telephony worldwide has been achieved through high demand, low-cost technologies, and market liberalization. Research on the diffusion of advanced telecommunications services in developing economies finds that the rate of adoption depends on an appropriate business environment—which depends in turn on the regulatory and policy environment.

Many countries that have created a competitive market environment for ICTs have more people using ICT services. Competition lowers prices for ICT services and expands markets. Prices for ICT services, such as mobile cellular phone tariffs, have been falling rapidly. But the services are still unaffordable for many people in low-income economies, leaving them yet to realize the potential of ICT for economic and social development.

ICT services range from telecommunication infrastructure (voice, data, and media services) to information applications tailored to specific sectors and functions (such as services in banking and finance, land management, education, and health), to electronic government (e-government), and to the production of equipment.

In developing economies innovative use of ICT services is changing people's lives and providing new opportunities. For example, banking services and job search text messaging services can be delivered through mobile phones and portable devices. Farmers and fishers also use these technologies to track prices and market demand.

Improving governance and contributing to growth

5a

E-government projects increase revenues and improve governance

Successful e-government projects have reduced transaction costs and processing time and increased government revenue. The e-Customs System in Ghana (GCNet) increased revenues 49 percent in the first 18 months of operation and reduced clearance times to two days from three weeks. And a land registration system has cut bribes \$18.3 million a year in the Indian state of Karnataka, where an overwhelming proportion of supervisors now sense that the abuse of discretionary power in providing services to citizens has narrowed.

Broadband increases productivity and contributes to growth

Although the benefits of broadband are not yet available to most people in developing economies, access to information and communication technology, especially broadband, supports the growth of firms by lowering costs and raising productivity. Analysis of broadband access in developed economies suggests a robust and noticeable growth dividend. For developing economies the growth benefit of broadband is about the same as that for developed economies—about a 1.4 percentage point increase in per capita GDP for each 10 percent increase in broadband coverage.

Source: World Bank forthcoming.

Mobile phones have captured the market in developing economies

At the end of 2007 there were about 1.1 billion fixed telephone lines and 3.3 billion mobile phone subscribers worldwide. Developing economies increased their share of mobile phone subscribers from about 30 percent of the world total in 2000 to more than 50 percent in 2004 and to about 70 percent in 2007 (figure 5b). But access to mobile phones is still low in many countries, including Burundi, Central African Republic, Eritrea, Ethiopia, and Papua New Guinea, with fewer than 5 mobile phone subscribers per 100 people.

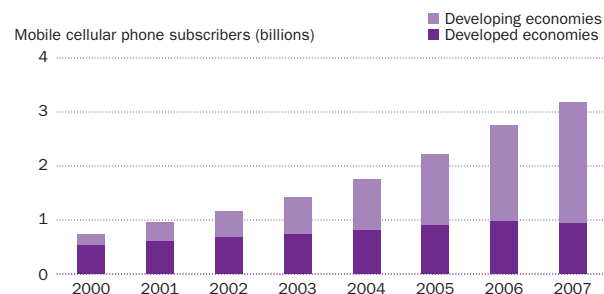
Mobile phone service in developing economies has overtaken fixed-line service. Wireless technology can be deployed more quickly than fixed-line telephone systems and requires less upfront investment in infrastructure. This translates to lower prices and stronger customer demand. Liberalization started later for fixed-line markets (previously dominated by state-owned monopolies), while mobile phone markets were generally opened to one or more new entrants from the start. And even where the opening of mobile phone markets was delayed, once they were opened competition often led to an immediate growth in mobile subscribers (figure 5c). Countries that have taken decisive steps to establish independent regulators and foster competition have seen greater improvements in sector performance. In some cases the announcement of

a plan to issue a new license has been enough to trigger growth, encouraging the existing mobile phone operator to improve service, reduce prices, and increase market penetration before the new entrant starts operations.

The demand for always-on, high-capacity Internet services is increasing. Advanced Internet service—beyond what can be achieved through dial-up connections—has become more important as the demand for data and value-added services grows. Broadband allows for large volumes of data to be transmitted and for cheaper voice communications (say, by routing calls over the Internet). Broadband also enables voice, data, and media services to be transmitted over the same network. This convergence of services can be very good for economic and social development—increasing productivity, lowering transaction costs, facilitating trade, and boosting retail sales and tax revenues. Where broadband has been introduced in rural areas of developing economies, villagers and farmers have gained better access to training, job opportunities, and market prices of crops. But in 2007 broadband reached just 2 percent of the population on average in developing economies, concentrated in urban areas. Why? Because of the relatively high cost of computers and, in rural areas, the limited access to electricity. Internet use (narrowband and broadband) in developing economies is only about one-fifth that in developed economies (figure 5d).

Seventy percent of mobile phone subscribers are in developing economies, 2000–07

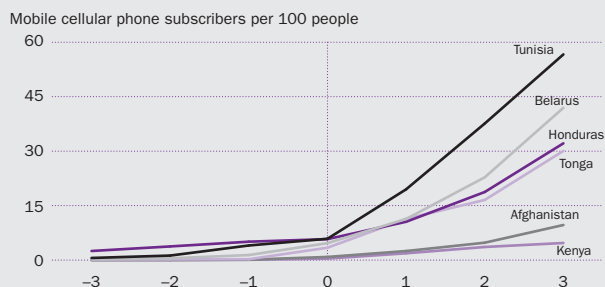
5b



Source: International Telecommunication Union, World Telecommunication/ICT Indicators database.

Competition can spur growth in mobile phone service

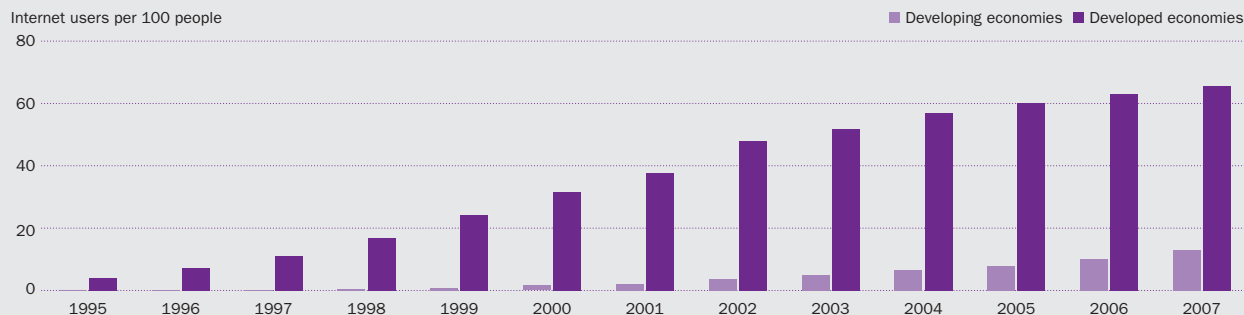
5c



Note: Year 0 is the year of entry of a second mobile operator.
Source: International Telecommunication Union, World Telecommunication/ICT Indicators database.

Internet use in developing economies is growing, but still lags behind use in developed economies

5d



Source: International Telecommunication Union, World Telecommunication/ICT Indicators database.

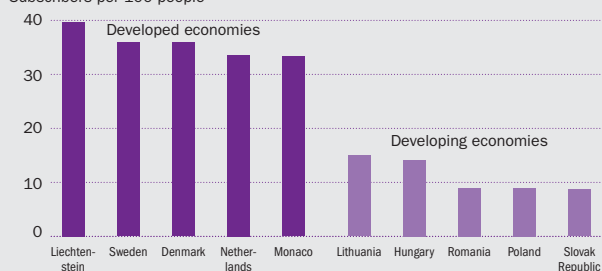
Broadband access is also limited in rural areas of some developed economies, such as the United States, where there is a renewed commitment to improve access to rural areas as part of an economic stimulus package. The goal is to create jobs, bring broadband to every community, and improve the U.S. ranking for per capita broadband access (with about 24 broadband subscribers per 100 people in 2007, the U.S. is below the top tier of developed economies; figure 5e).

Although the capacity of broadband service is measured by the advertised speed available to consumers, speed may be constrained by bandwidth availability (effective rate of data transfer), which is increasing faster in developed economies, with their robust infrastructure, than in developing economies. In high-income economies, average per capita international bandwidth increased from 586 bits per second (bps) in 2000 to 18,240 bps in 2007. Among developing regions Europe and Central Asia and Latin America and the Caribbean have the greatest capacity. Over 2000–07 bandwidth per capita increased from 12 bps to 1,114 bps in Europe and Central Asia and from 8 bps to 1,126 bps in Latin America and the Caribbean. With improved fiber-optic connectivity some countries in South Asia are seeing a rise in international bandwidth, yet South Asia and Sub-Saharan Africa are still well behind other regions in international bandwidth per capita (figure 5f).

Broadband access in developed and developing economies

5e

Subscribers per 100 people

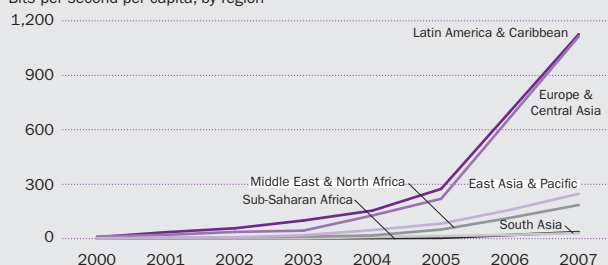


Source: International Telecommunication Union, World Telecommunication/ICT Indicators database.

International bandwidth has increased rapidly in Europe and Central Asia and Latin America and the Caribbean

5f

Bits per second per capita, by region



Source: International Telecommunication Union, World Telecommunication/ICT Indicators database and World Development Indicators data files.

To unleash ICT's potential impact on growth, services must be affordable to more people

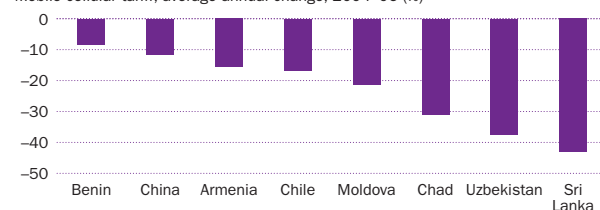
The price of ICT access continues to fall with technological advances, market growth, and greater competition, a trend that is especially important in allowing people in developing economies to take full advantage of ICT services. In recent years steep price reductions have contributed to the rapid expansion of mobile phone use in many economies (figures 5b and 5g). Prepaid services allow mobile customers to pay in small amounts instead of committing to fixed monthly subscriptions. Prepaid cards give even low-income consumers access to mobile communications, increasing penetration in poor and rural areas.

Pricing for Internet access has also been falling in many countries, including many Sub-Saharan countries (figure 5h). Still, the average price in Sub-Saharan Africa as a whole continues to be well above the world average and, as measured against income, is not affordable for most people. In 2006 the Internet access tariff for Sub-Saharan Africa was about 62 percent of average monthly per capita income, far more than the roughly 12 percent in South Asia, and less than the 9 percent average for all other developing regions. In high-income economies Internet service costs less than 1 percent of the average monthly income.

Prices for mobile phone services have declined in many countries

5g

Mobile cellular tariff, average annual change, 2004–06 (%)



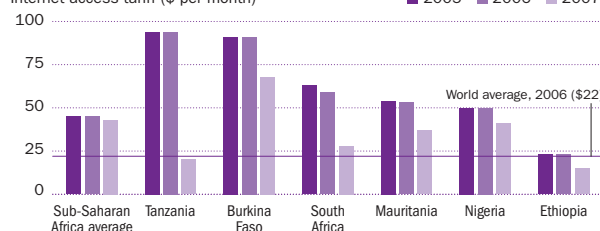
Note: Tariff is based on the prepaid price for 25 calls per month spread over the same mobile network, other mobile networks, and mobile to fixed calls and during peak, off-peak, and weekend times (Organisation for Economic Co-operation and Development low user definition). It also includes 30 text messages per month. Countries that have experienced significant reductions in mobile phone service prices do not necessarily have the lowest prices.

Source: International Telecommunication Union, World Telecommunication/ICT Indicators database.

Internet service prices have fallen in some Sub-Saharan African countries, 2005–07

5h

Internet access tariff (\$ per month)



Note: Tariff is based on the cheapest available tariff for accessing the Internet for 20 hours a month (10 hours peak and 10 hours off-peak). The basket does not include the telephone line rental but does include any usage charges.

Source: International Telecommunication Union, World Telecommunication/ICT Indicators database.

Developing economies benefit from ICT exports

Although ICT exports do not necessarily reflect high rates of ICT use, they indicate the importance of a country's ICT sector and its international competitiveness. As barriers to ICT trade are removed, opportunities for developing economies to benefit from such exports will likely grow.

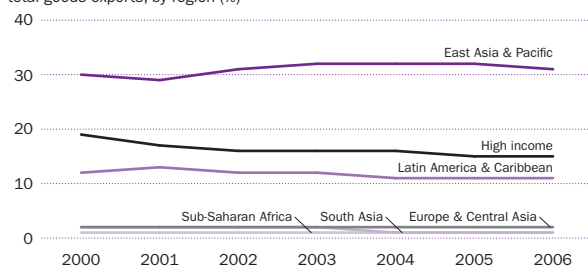
Some developing economies have already become key exporters of ICT goods. China leads in dollar values of ICT export goods in 2006, with \$299 billion. For many countries in East Asia and Pacific ICT export goods make up a large share of total goods exports (figure 5i). The share is 56 percent for the Philippines, 46 percent for Singapore, 45 percent for Malaysia, 42 percent for Hong Kong, China, and 31 percent for China.

Trade in ICT services includes communications services (telecommunications, business network services, teleconferencing, support services, and postal services) and computer and information services (databases, data processing, software design and development, maintenance and repair, and news agency services). India's software exports jumped from about \$1 billion in 1995 to \$22 billion in 2006, generating employment for about 1.6 million people. India leads all other developing economies in exports of communication, computer, and information services as a share of total service exports, at 42 percent in 2006 (table 5j).

East Asia & Pacific leads in share of information and communication technology goods exports

5i

Information and communication technology goods exports as a share of total goods exports, by region (%)



Source: United Nations Statistics Division Commodity Trade (Comtrade) database.

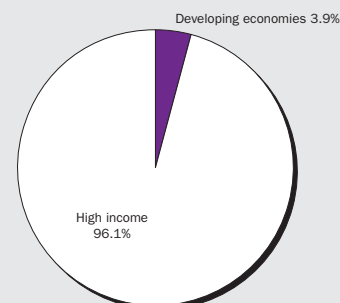
ICT applications are transforming how information is shared and transactions are made

Governments are becoming increasingly important users of ICT, particularly for e-government—using Internet technology as a platform for exchanging information, providing services, and transacting with citizens, businesses, and other arms of government. That makes them major actors in fostering ICT uptake and setting information technology standards. E-government initiatives can make public administration more efficient, improve delivery of public services, and increase government accountability and transparency. They can also reduce transaction costs and processing times and increase government revenues. Some e-government projects have also improved governance, so vital for development.

A secure, reliable business-enabling environment is a key element of e-commerce. Privacy and security concerns about the transmission of personal or financial information over the Internet are major issues for both consumers and firms, perhaps explaining why they can be reluctant to use the Internet to make transactions. The number of secure servers indicates how many companies are conducting encrypted transactions over the Internet. Developing economies have only a fraction of the world's secure servers—about 4 percent (figure 5k).

Developing economies have only about 4 percent of the world's secure servers, 2008

5k



Source: Netcraft (www.netcraft.com).

India leads developing economies in information and communications technology service export shares, 2007

5j

ICT service exports as a share of total service exports (%)

| Top five developing economies | |
|-------------------------------|-------------------|
| Country | Share (percent) |
| India | 41.6 ^a |
| Niger | 38.8 ^a |
| Guyana | 21.5 |
| Yemen, Rep. | 18.9 ^a |
| Romania | 16.3 |

a. Data are for 2006.

Source: International Monetary Fund, Balance of Payments Statistics Yearbook database.

| Top five developed economies | |
|------------------------------|-----------------|
| Country | Share (percent) |
| Kuwait | 48.8 |
| Ireland | 30.1 |
| Israel | 28.5 |
| Canada | 11.1 |
| Finland | 8.4 |

Progress in measuring ICT

Improving ICT indicators to analyze the impact of ICT on development was highlighted at the World Summits on the Information Society, held in Geneva in 2003 and Tunis in 2005. Attending were 50 heads of state, prime ministers, and vice presidents—and 80 ministers and vice ministers from 180 countries. The challenge has been taken up by the Partnership on Measuring ICT for Development, with country statistical offices and ICT agencies (box 5I).

The partnership was launched in 2004 with the following objectives to improve ICT measures:

- Continue to raise awareness among policymakers about the importance of statistical indicators for monitoring ICT policies and carrying out impact analysis.
- Expand the core list of indicators to other areas of interest such as ICT in education, government, and health, building on the original core ICT list of access and use by individuals, households and businesses, and production and trade in ICT goods and services.
- Conduct regional workshops to exchange national experiences and discuss methodologies, definitions, survey vehicles, and data collection efforts.
- Assist statistical agencies in developing economies in ICT data collection and dissemination, including national databases to store and analyze survey results.
- Develop a global database of ICT indicators and make it available on the World Wide Web.

In May 2008 the partnership published the *Global Information Society: A Statistical View*, with information on more than 40 core ICT indicators covering ICT infrastructure; access and use of ICT by households, individuals, and businesses; ICT in education; and ICT sector activity and trade in ICT goods (see <http://measuring-ict.unctad.org> for a complete list).

Partnership on Measuring ICT for Development

5I

Members of the Partnership on Measuring ICT for Development include a wide range of organizations:

- Eurostat.
- International Telecommunication Union.
- Organisation for Economic Co-operation and Development.
- United Nations Conference on Trade and Development.
- United Nations Economic Commission for Africa.
- United Nations Economic Commission for Asia and the Pacific.
- United Nations Economic Commission for Latin America and the Caribbean.
- United Nations Economic Commission for Western Asia.
- United Nations Educational, Scientific, and Cultural Organization's Institute for Statistics.
- World Bank.