



STATES AND MARKETS



**The key
to improving the
investment climate can
be simply stated:
improving the connection
between sowing
and reaping.**

Nicholas Stern,
Chief Economist and Senior Vice President,
World Bank

A good investment climate promotes growth and reduces poverty

People rise from poverty when countries act on two pillars of development: building a good investment climate in which private entrepreneurs will invest, generate jobs, and produce efficiently, and empowering poor people and investing in them so that they can participate in economic growth.

What's a good investment climate? Start with sound macroeconomic management and trade and investment policies that promote openness and raise productivity and growth. Add the elements of good governance, such as regulation of industry, promotion of competition, and prevention of corruption. Then set all that on a foundation of basic infrastructure and effective basic services, such as health and education.

The case for creating a good investment climate is simple: an economy needs a predictable environment for people, ideas, and money to work together productively and efficiently. The role of government is to provide ample room for entrepreneurs to invest in agriculture, industry, and services. That allows private firms—small and large, domestic and foreign—operating in competitive markets to be the engine of growth and job creation, providing opportunities to escape poverty.

Countries should focus first on improving the investment climate for domestic entrepreneurs. An improved climate will also attract foreign investors. In today's globalizing world, countries with a good investment climate get more foreign investment—an important conduit for new technology, management experience, and access to markets—and enjoy faster growth and more poverty reduction.

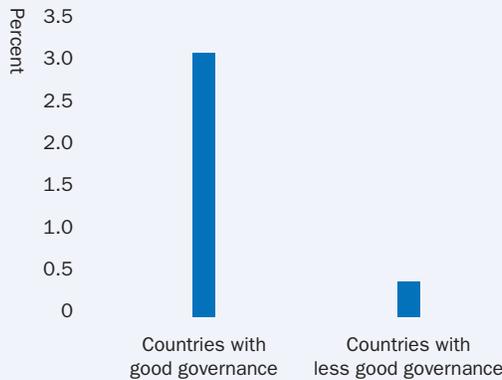
Good governance and strong institutions

Good governance and strong institutions can create an environment that encourages markets and entrepreneurs to flourish. Too often, however, corrupt or ineffective government bureaucracies administer regulations and enforce laws selectively, raising the cost of doing business. Consumers must then pay more for goods and services.

So, what can governments do to improve productivity and

Institutional capability improves economic growth

Average annual per capita GDP growth, 1964–94



Source: World Bank 2000 "Reforming Public Institutions and Strengthening Governance."

employment? They can streamline cumbersome regulations, such as the red tape that controls business startups and liquidation of failing businesses. They can promote more flexible labor regulation, providing safety nets for displaced workers. And they can strengthen their legal and judicial systems.

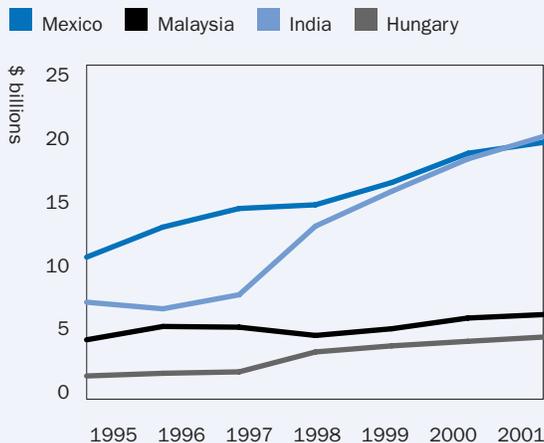
Countries with good governance grow faster than countries with less good governance. Between 1964 and 1994 GDP per capita rose an average of 3 percent a year in countries with good governance, more than seven times the 0.4 percent a year in those with low capabilities and poor policies.

What makes for a good investment climate?

Openness and integration with the global economy

A stable economy—with low inflation, steady growth, and balanced government spending and revenues—is an important part of a good investment climate. So is social and political stability.

Spending on information and communications technology is increasing in newly globalizing economies



Source: WITSA 2002.

Openness to the global economy brings greater trade and private capital flows. It also brings new technologies, such as those for information and communications, which benefit consumers and businesses by improving labor skills and increasing business efficiency.

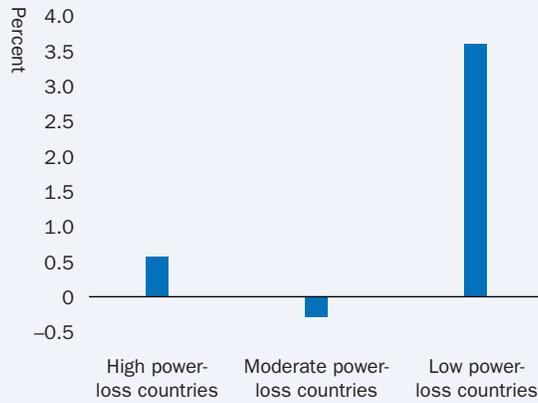
High-quality infrastructure

High-quality infrastructure and other business support services help determine the success of manufacturing and agricultural businesses.

So if reliable and affordable power, telecommunications, transport, and water are not available, entrepreneurs will not be inclined to do business in a region or a country. Small and medium-size enterprises are especially at a disadvantage, since they often cannot afford the high cost of generating their own power when blackouts occur.

Losses in power transmission slow growth in manufacturing

Average annual growth in manufacturing, 1990–99



Source: World Development Indicators 2002 database.

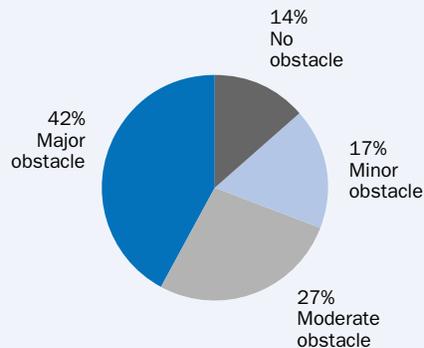
In competitive environments private firms can improve the provision of infrastructure and other support services. But they have to be regulated well. One way to encourage firms to provide these services is to remove long-standing (and usually unjustified) barriers to their doing so.

Good governance, openness, high-quality infrastructure

Assessing the investment climate

Surveys of private enterprises can inform governments and build public support for reform. The Business Environment and Enterprise Performance Survey (BEEPS), developed by the World Bank and the European Bank for Reconstruction and Development (EBRD), examined a wide range of interactions between firms and the state for more than 4,000 firms in 22 transition economies in 1999–2000.

Firms view policy instability as a major obstacle to doing business in transition economies



Source: World Bank and EBRD, Business Environment and Enterprise Performance Survey, 1999–2000.

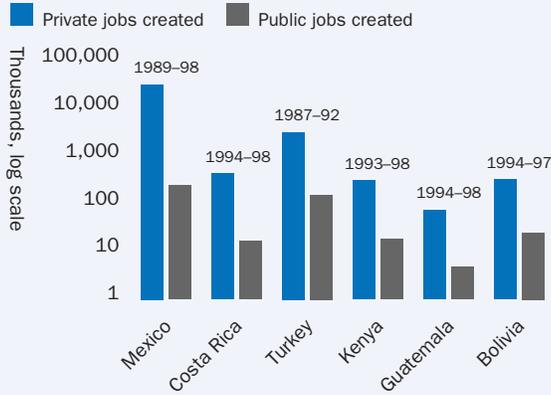
Based on face-to-face interviews with firm managers and owners, BEEPS generated comparative measures in such areas as corruption, state capture, lobbying, and the quality of the business environment. These measures were then related to firm characteristics and performance. For example, 42 percent of surveyed firms view political instability as a major obstacle.

A dynamic economy needs the private sector to create jobs

Private firms are a powerful source of job creation, and their growth brings more growth to the entire economy—the biggest factor in poverty reduction. For a range of developing countries, the private sector provides many more of the new jobs than does the public sector. In fact, most poor people work in the private sector—formal and informal.

Private firms create most new jobs

Number of jobs created, selected countries and years



Source: Pfefferman 2000.

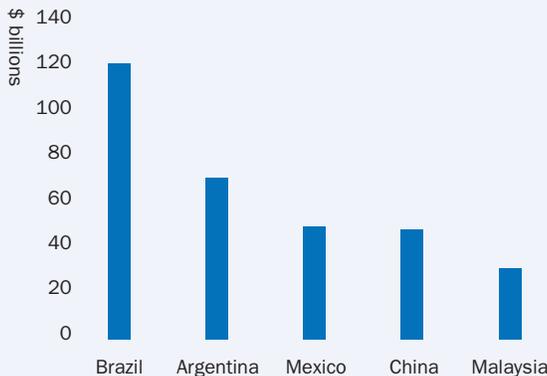
Building a good investment climate

High-quality infrastructure is key to long-term sustainable growth

Investment in infrastructure—whether in power, transport, telecommunications, housing, or water and sanitation—enables businesses and communities to grow. It also helps people stay healthy, learn new skills, and earn a better living.

Top five developing countries in private participation in infrastructure

Total investment in infrastructure projects with private participation, selected countries, 1990–2000



Source: Table 5.1.

Private participation in infrastructure can improve access to basic infrastructure services, providing a key to poverty reduction. In developing countries private participation in infrastructure is mainly in telecommunications and energy.

Brazil, Argentina, Mexico, China, and Malaysia had the highest private participation in infrastructure projects in developing economies in the 1990s.

Smaller enterprises make the economy flourish

A recent World Bank survey of more than 10,000 firms in 80 countries found that small and medium-size firms were at a competitive disadvantage to larger ones. Smaller firms lacked the resources and political clout to struggle against corruption, burdensome taxation and regulation, and unreliable power supplies.

Helping those smaller enterprises thrive can improve people's lives and reduce poverty. Why? Because most poor people in the developing world work in small and medium-size enterprises, including farms. For many of these workers the issue is more one of accessing their local markets than one of technology. In fact, most poor people (70 percent) live in rural areas, and their escape from poverty lies in their ability to better market their agricultural products and to develop off-farm employment activities. Improving the investment climate will also benefit small enterprises in the developing world's cities, where the population is expected to double from around 2 billion to 3.8 billion over the next 30 years.

The Mekong Project Development Facility was launched in 1997 to support the establishment and growth of smaller enterprises in Vietnam, Cambodia, and the Lao People's Democratic Republic. These projects are effective in reducing poverty. For example, in 2000 the Hagar Project in Cambodia helped 6,100 women learn new skills such as handicraft production to provide income-generating opportunities.

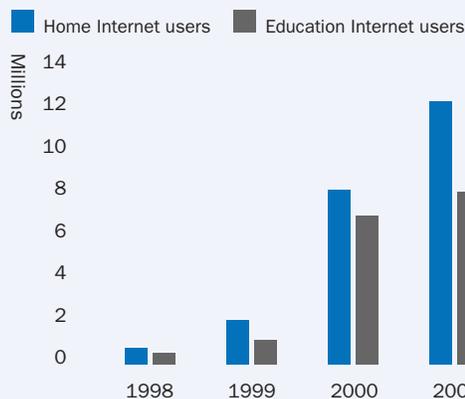
is crucial for strong growth

A knowledge economy makes investment and labor more effective

The global knowledge revolution, led by information and communications technology, is at the doorstep of all countries. But the door has to be open to turn ideas and technologies into competitive businesses that create jobs and help economies grow.

Use of the Internet has increased dramatically in the Republic of Korea

Use of the Internet in homes and schools, 1998–2001



Source: WITSA 2002.

One important aspect of a knowledge economy is ensuring access for all to computers and the Internet. In April 2000 the Republic of Korea decided to eliminate the digital divide—the gap between those with access to information and communications technology and those without. So far the government has distributed personal computers to 80 percent of teachers, and 96 percent of central government officials have email accounts. Computer training has also been offered to 300,000 housewives and 9,000 farmers and fishers.

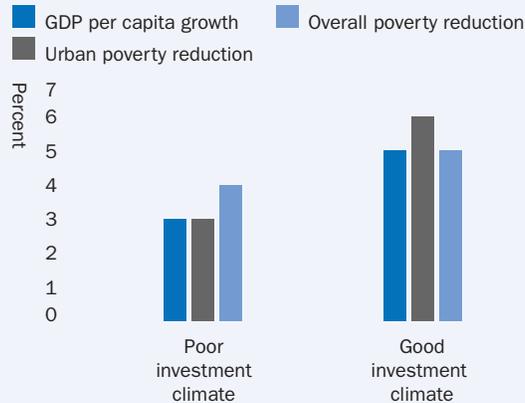
A good investment climate helps reduce poverty

A good investment climate does more than reward entrepreneurs and generate strong growth. It is also associated with poverty reduction. But for growth to help poor people, they need to participate in the growth process.

What does it take to increase the participation of poor people in the economy? Invest in areas that empower them to improve their standard of living and shape their own lives: education, health

Growth and poverty reduction were higher in Indian states with good investment climates

Change between 1993/94 and 1999/2000



Source: World Bank data.

services, social protection, and participatory processes. As healthier, more educated people participate in the economy, productivity and growth increase, leading to greater poverty reduction.

A recent investment climate survey covering 10 Indian states found that growth and poverty reduction were higher in the “good investment climate states” between 1993/94 and 1999/2000 than in “poor investment climate” states.

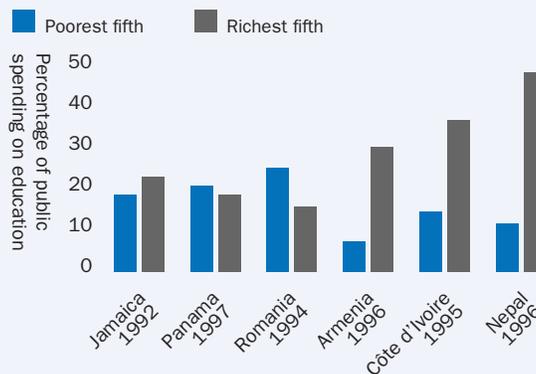
Improving the investment climate

Empowerment and poverty reduction

Increasing income is not the whole story of poverty reduction, for poverty has other human dimensions that are equally important to address: lack of voice and participation in society, vulnerability to health risks and violence, and lack of educational opportunities. Investing in poor people and the education and health services they need can thus enable them to shape their lives and participate as full citizens in their communities.

Governments can make public spending more pro-poor

Distribution of public spending on education by quintile, selected countries



Source: World Bank 2000b.

What can governments do to help the poor? They can shift spending to strengthen public services for poor people.

In some countries spending on education is well distributed across all income levels. But in others it is unevenly distributed. In Jamaica, Panama, and Romania the poorest and richest fifths of the population receive about the same shares of public spending on education. But in Armenia, Côte d'Ivoire, and Nepal the richest fifth receives two to four times as much.

Private provision of infrastructure and social services

Poor people in developing countries usually have inadequate access to water, power, transport systems, and social services such as health and education. And when they do have access, the services are often low in quality or more expensive than those provided to better-off people. For example, poor people who have to buy water from vendors pay 10–40 times more than richer people who have water supplied by pipes to their homes.

Examples of successful small private service providers

- In Cambodia hundreds of small private providers have improved the access of poor households to electricity. These small private providers supply power to more than 115,000 customers, or about a third of the country's customers.
- In Paraguay small water companies supplying customers in urban perimeters have increased access to piped water at prices only slightly higher than those of public water suppliers.

In recent years improvements in technology have made smaller scale provision of infrastructure services feasible. But for the private sector to supply these services, an effective regulatory system has to ensure that the price and quality of services meet appropriate standards.

benefits the poor

Microcredit

Large, formal financial institutions seldom lend to the poor. But poor people need financial services to invest in businesses and homes.

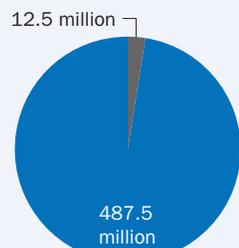
Many microfinance institutions around the world are beginning to meet the demand for reliable financial services for the poor. It is estimated that 500 million people worldwide need access to microfinance, which now reaches only about 12.5 million.

Informal microfinancing has been around for a long time in the form of family loans and savings clubs. In 1995 the Consultative Group to Assist the Poorest (CGAP) was

Microfinance reaches only a tiny share of those who need it

Number of people needing access to microfinance

- Those with access to microfinance
- Those without access to microfinance



Source: CGAP 2000.

formed to increase the quality and quantity of microfinance institutions, which often serve the very poorest people in a community, with loans as small as \$50.

The Consultative Group focuses on five main areas:

- Supporting the development of microfinance institutions.
- Supporting changes in the practices of member donors to improve their microfinance operations.
- Increasing the poverty outreach of microfinance institutions.
- Improving the legal and regulatory framework for microfinance institutions.
- Facilitating the commercialization of the industry.

Microcredit for poor women

Nirdan, an NGO in Nepal, has about 17,000 active loans and 33,000 savings accounts, all for poor women. It makes small loans to small groups of women, who are jointly liable for the loans.



5.1 | Private sector development

| | Private fixed investment | | Domestic credit to private sector | | Investment in infrastructure projects with private participation ^a | | | | | | | |
|--------------------------|--------------------------------------|-------------------|-----------------------------------|-------|-------------------------------------------------------------------------------|-----------|-----------------------|-----------|--------------------------|-----------|-------------------------------------|-----------|
| | % of gross domestic fixed investment | | % of GDP | | Telecommunications \$ millions | | Energy \$ millions | | Transport \$ millions | | Water and sanitation \$ millions | |
| | 1990 | 1999 | 1990 | 2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 |
| Afghanistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Albania | .. | .. | .. | 4.5 | .. | 102.2 | .. | .. | .. | .. | .. | .. |
| Algeria | .. | .. | 44.4 | 6.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Angola | .. | .. | .. | 2.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 67.4 | 89.9 | 15.6 | 23.8 | 9,262.0 | 12,991.3 | 9,899.9 | 13,694.4 | 5,373.9 | 8,965.5 | 4,075.0 | 4,172.5 |
| Armenia | .. | .. | 40.4 | 10.6 | .. | 442.0 | .. | .. | .. | .. | .. | .. |
| Australia | 88.4 ^b | 90.4 ^b | 64.4 | 87.9 | .. | .. | .. | .. | .. | .. | .. | .. |
| Austria | .. | 92.3 | 91.6 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Azerbaijan | .. | 86.7 | 9.4 | 5.9 | 14.0 | 127.6 | .. | .. | .. | .. | .. | .. |
| Bangladesh | 57.5 | 69.7 | 16.7 | 24.7 | 116.0 | 543.4 | .. | 1,040.2 | .. | .. | .. | .. |
| Belarus | .. | .. | .. | 8.9 | 10.0 | 15.0 | .. | 500.0 | .. | .. | .. | .. |
| Belgium | 92.8 ^b | 91.4 ^b | 8.1 | 6.7 | .. | .. | .. | .. | .. | .. | .. | .. |
| Benin | 44.7 | 60.1 | 20.3 | 12.6 | .. | 90.4 | .. | .. | .. | .. | .. | .. |
| Bolivia | 39.4 | 61.6 | 24.0 | 59.5 | 20.0 | 670.4 | .. | 941.6 | .. | 163.2 | .. | 682.0 |
| Bosnia and Herzegovina | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Botswana | .. | .. | 9.4 | 16.1 | .. | 80.0 | .. | .. | .. | .. | .. | .. |
| Brazil | 76.7 ^b | 86.2 ^b | 38.9 | 37.6 | .. | 53,692.4 | 212.0 | 40,048.1 | 328.1 | 19,545.9 | 2.5 | 2891.4 |
| Bulgaria | 3.6 | 50.3 | 7.2 | 14.6 | 37.5 | 207.9 | .. | .. | .. | .. | .. | 152.0 |
| Burkina Faso | .. | .. | 19.0 | 14.0 | .. | .. | .. | 5.6 | .. | .. | .. | .. |
| Burundi | .. | .. | 13.7 | 23.5 | 0.5 | 15.6 | .. | .. | .. | .. | .. | .. |
| Cambodia | 89.5 | 60.7 | .. | 7.3 | 30.1 | 104.8 | .. | 89.0 | .. | 120.0 | .. | .. |
| Cameroon | .. | .. | 26.7 | 9.3 | .. | 72.7 | .. | .. | 30.8 | 95.0 | .. | .. |
| Canada | 86.3 ^b | 89.4 ^b | 76.1 | 80.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Central African Republic | .. | .. | 7.2 | 4.5 | .. | 1.1 | .. | .. | .. | .. | 0.7 | .. |
| Chad | .. | 62.5 | 7.3 | 3.4 | .. | 2.0 | .. | .. | .. | .. | .. | .. |
| Chile | 79.3 | 68.3 | 47.2 | 68.0 | 95.9 | 993.9 | 1,326.2 | 5,604.1 | 120.4 | 3,803.0 | 127.6 | 3,719.9 |
| China | 33.9 ^c | 46.6 ^c | 87.7 | 124.6 | .. | 5,970.0 | 5,459.1 | 15,001.2 | 5,910.5 | 13,137.9 | 42.8 | 796.7 |
| Hong Kong, China | .. | .. | 165.1 | 158.7 | .. | .. | .. | .. | .. | .. | .. | .. |
| Colombia | 61.5 | 39.2 | 30.8 | 27.7 | 1,354.7 | 1,494.8 | 540.0 | 7,035.4 | 813.0 | 1,743.9 | .. | 272.0 |
| Congo, Dem. Rep. | .. | .. | 1.8 | .. | .. | 45.0 | .. | .. | .. | .. | .. | .. |
| Congo, Rep. | .. | .. | 15.7 | 4.8 | .. | 70.3 | .. | 325.0 | .. | .. | .. | .. |
| Costa Rica | 78.9 | 76.8 | 15.8 | 24.1 | .. | .. | 18.2 | 301.2 | .. | 185.0 | .. | .. |
| Côte d'Ivoire | 57.8 | 74.1 | 36.5 | 17.2 | .. | 802.4 | 109.6 | 260.6 | .. | 178.0 | .. | .. |
| Croatia | .. | 77.3 | .. | 36.2 | .. | 978.0 | .. | 368.5 | .. | 672.2 | .. | .. |
| Cuba | .. | .. | .. | .. | 371.0 | .. | .. | 165.0 | .. | .. | .. | 600.0 |
| Czech Republic | 86.4 | 82.0 | .. | 49.7 | 41.0 | 7,634.9 | 356.0 | 944.1 | .. | 390.4 | 16.0 | 36.9 |
| Denmark | 91.8 ^b | 91.7 ^b | 52.2 | 34.4 | .. | .. | .. | .. | .. | .. | .. | .. |
| Dominican Republic | 73.0 | 76.3 | 27.5 | 34.9 | 5.0 | 163.0 | 87.5 | 1,556.3 | .. | 633.9 | .. | .. |
| Ecuador | 67.0 | 49.5 | 13.2 | 33.4 | 27.6 | 716.4 | .. | 310.0 | 12.5 | 686.8 | .. | .. |
| Egypt, Arab Rep. | 62.2 | 65.2 | 30.6 | 59.3 | .. | 2,297.7 | .. | 1,376.0 | .. | 492.2 | .. | .. |
| El Salvador | 81.4 | 80.7 | 20.1 | 41.3 | .. | 651.5 | .. | 975.2 | .. | .. | .. | .. |
| Eritrea | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Estonia | 95.0 | 83.5 | 20.2 | 26.3 | 136.1 | 704.6 | .. | 26.5 | .. | 15.8 | .. | 81.0 |
| Ethiopia | .. | .. | 19.5 | 29.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Finland | 86.9 ^b | 84.5 ^b | 86.7 | 52.3 | .. | .. | .. | .. | .. | .. | .. | .. |
| France | .. | .. | 96.1 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Gabon | .. | .. | 13.0 | 8.9 | .. | 20.7 | .. | 624.8 | .. | 46.7 | .. | 624.8 |
| Gambia, The | 66.8 | 67.9 | 11.0 | 12.5 | .. | .. | .. | .. | .. | .. | .. | .. |
| Georgia | .. | .. | .. | 8.8 | 11.6 | 53.8 | .. | 65.0 | .. | .. | .. | .. |
| Germany | .. | .. | 89.7 | 120.3 | .. | .. | .. | .. | .. | .. | .. | .. |
| Ghana | .. | .. | 4.9 | 14.1 | 20.0 | 441.1 | .. | .. | .. | 10.0 | .. | .. |
| Greece | .. | 83.9 ^b | 36.3 | 53.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Guatemala | 79.9 | 82.9 | 14.2 | 20.1 | .. | 1,463.3 | 100.0 | 1,273.2 | .. | 33.8 | .. | .. |
| Guinea | .. | .. | 3.5 | 4.0 | .. | 120.3 | .. | 36.4 | .. | .. | .. | .. |
| Guinea-Bissau | 28.1 | 32.0 | 22.0 | 7.9 | .. | .. | 23.2 | .. | .. | .. | 23.2 | .. |
| Haiti | 57.8 | 51.8 | 12.1 | 15.6 | .. | 1.5 | .. | .. | .. | .. | .. | .. |
| Honduras | .. | .. | 31.1 | 41.3 | .. | 38.1 | 70.0 | 112.1 | .. | 130.5 | .. | .. |



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|--------------------|--------------------------------------|-------------------|-----------------------------------|-------|-------------------------------------------------------------------------------|-----------|-----------------------|-----------|--------------------------|-----------|-------------------------------------|-----------|
| | % of gross domestic fixed investment | | % of GDP | | Telecommunications \$ millions | | Energy \$ millions | | Transport \$ millions | | Water and sanitation \$ millions | |
| | 1990 | 1999 | 1990 | 2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 |
| Hungary | .. | .. | 46.6 | 30.9 | 1,623.2 | 7,072.1 | .. | 3,872.1 | 1086.0 | 135.0 | .. | 170.5 |
| India | 60.8 | 70.1 | 25.2 | 29.0 | 96.7 | 10,063.6 | 2,139.2 | 9,683.8 | 126.9 | 1,055.7 | .. | 216.0 |
| Indonesia | 69.7 | 61.0 | 46.9 | 20.9 | 1,119.0 | 9,602.7 | 352.5 | 9,817.1 | 709.8 | 2,223.1 | 3.8 | 882.8 |
| Iran, Islamic Rep. | 53.8 | 58.6 | 32.5 | 30.7 | .. | 28.0 | .. | .. | .. | .. | .. | .. |
| Iraq | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ireland | 88.8 ^b | 88.7 ^b | 47.6 | 108.6 | .. | .. | .. | .. | .. | .. | .. | .. |
| Israel | .. | .. | 57.6 | 86.9 | .. | .. | .. | .. | .. | .. | .. | .. |
| Italy | .. | .. | 56.5 | 77.6 | .. | .. | .. | .. | .. | .. | .. | .. |
| Jamaica | .. | .. | 39.0 | 32.9 | .. | 44.5 | 246.0 | 43.0 | 30.0 | .. | .. | .. |
| Japan | 84.2 ^b | 78.5 ^b | 195.2 | 187.7 | .. | .. | .. | .. | .. | .. | .. | .. |
| Jordan | .. | .. | 72.3 | 77.6 | 43.0 | 549.9 | .. | .. | .. | 182.0 | .. | 55.0 |
| Kazakhstan | .. | 88.1 | .. | 13.1 | 30.0 | 1,743.5 | .. | 2,411.7 | .. | .. | .. | 40.0 |
| Kenya | 54.6 | 67.1 | 32.8 | 30.1 | .. | 107.0 | .. | 171.5 | .. | 53.4 | .. | .. |
| Korea, Dem. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Korea, Rep. | 86.8 | 78.7 | 65.5 | 101.9 | 2,379.0 | 17,050.9 | .. | 2,688.2 | .. | 6,268.3 | .. | .. |
| Kuwait | .. | .. | 52.1 | 51.9 | .. | .. | .. | .. | .. | .. | .. | .. |
| Kyrgyz Republic | .. | .. | .. | 4.4 | .. | 94.0 | .. | .. | .. | .. | .. | .. |
| Lao PDR | .. | .. | 1.0 | 9.0 | .. | 160.8 | .. | 535.5 | .. | .. | .. | .. |
| Latvia | .. | .. | .. | 18.6 | 180.0 | 782.0 | .. | 154.0 | .. | 75.0 | .. | .. |
| Lebanon | .. | .. | 79.4 | 92.0 | 50.0 | 323.0 | .. | .. | .. | 200.0 | .. | .. |
| Lesotho | .. | .. | 15.8 | 14.2 | .. | 16.5 | .. | .. | .. | .. | .. | .. |
| Liberia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Libya | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | .. | 63.6 | .. | 11.5 | 30.0 | 1,222.3 | .. | 20.0 | .. | .. | .. | .. |
| Macedonia, FYR | .. | .. | .. | 17.9 | .. | .. | .. | .. | .. | .. | .. | .. |
| Madagascar | 46.5 | 52.9 | 16.9 | 9.2 | 5.0 | 10.1 | .. | .. | .. | .. | .. | .. |
| Malawi | 51.8 | 17.6 | 12.3 | 6.2 | .. | 34.7 | .. | .. | .. | 6.0 | .. | .. |
| Malaysia | 64.6 | 50.6 | 69.4 | 135.5 | 1,618.0 | 3,615.3 | 5,709.5 | 2,101.1 | 2,768.6 | 9,228.7 | 3,976.7 | 1,115.5 |
| Mali | .. | .. | 12.8 | 17.5 | .. | .. | 0.1 | 697.3 | .. | .. | 0.1 | 697.3 |
| Mauritania | 68.9 | 36.7 | 43.5 | 26.7 | .. | 28.1 | .. | .. | .. | .. | .. | .. |
| Mauritius | 62.8 | 78.7 | 33.2 | 61.4 | .. | .. | .. | 109.3 | .. | 42.6 | .. | .. |
| Mexico | 76.1 | 89.9 | 17.5 | 13.2 | 15,840.0 | 13,386.8 | .. | 4,560.1 | 7,583.7 | 5,630.2 | 295.1 | 276.5 |
| Moldova | .. | .. | 5.9 | 12.7 | .. | 84.6 | .. | 85.3 | .. | .. | .. | .. |
| Mongolia | .. | .. | 19.0 | 8.1 | .. | 35.2 | .. | .. | .. | .. | .. | .. |
| Morocco | 65.6 | 71.1 | 34.0 | 58.6 | .. | 3,375.0 | 2,300.0 | 5,819.9 | .. | .. | .. | 4,050.9 |
| Mozambique | .. | .. | 17.6 | 18.7 | .. | 29.0 | .. | .. | .. | .. | .. | 0.6 |
| Myanmar | .. | .. | 4.7 | 8.6 | .. | 4.0 | .. | .. | .. | 50.0 | .. | .. |
| Namibia | 61.4 | 55.4 | 21.0 | 44.7 | .. | 22.0 | .. | 5.0 | .. | .. | .. | .. |
| Nepal | .. | .. | 12.8 | 30.7 | .. | .. | 131.4 | 137.2 | .. | .. | .. | .. |
| Netherlands | .. | .. | 79.7 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| New Zealand | .. | .. | 76.9 | 117.7 | .. | .. | .. | .. | .. | .. | .. | .. |
| Nicaragua | 54.7 | 51.6 | 112.6 | 54.5 | 6.6 | 24.5 | .. | 347.4 | .. | 104.0 | .. | .. |
| Niger | .. | .. | 12.3 | 4.7 | .. | 11.5 | .. | .. | .. | .. | .. | .. |
| Nigeria | .. | .. | 9.4 | 13.9 | .. | 117.7 | .. | .. | .. | .. | .. | .. |
| Norway | 83.5 ^b | 83.8 ^b | 82.2 | 78.8 | .. | .. | .. | .. | .. | .. | .. | .. |
| Oman | .. | .. | 22.9 | 44.6 | .. | .. | 204.5 | 183.0 | .. | 106.1 | .. | .. |
| Pakistan | 51.7 | 62.3 | 27.7 | 29.4 | 581.5 | 133.5 | 1,638.7 | 5,054.3 | .. | 418.3 | .. | .. |
| Panama | 86.9 | 88.8 | 46.7 | 119.7 | .. | 1,429.2 | .. | 1,064.9 | 169.9 | 1,046.0 | .. | 25.0 |
| Papua New Guinea | 79.6 | 77.1 | 28.6 | 15.8 | .. | .. | .. | 50.0 | .. | .. | .. | 818.0 |
| Paraguay | 87.4 | 64.3 | 15.8 | 25.7 | 33.2 | 199.3 | .. | .. | .. | 58.0 | .. | .. |
| Peru | 80.0 | 77.8 | 11.8 | 25.9 | 1,645.0 | 5,378.2 | 451.2 | 3,322.9 | 6.6 | 86.8 | .. | .. |
| Philippines | 81.7 | 69.2 | 22.3 | 44.5 | 591.8 | 5,539.6 | 4,502.1 | 9,272.3 | .. | 3,088.8 | .. | 5,820.0 |
| Poland | 41.3 | 62.1 | 3.1 | 26.0 | 273.0 | 9,899.6 | .. | 1,052.6 | 3.1 | 705.9 | .. | 22.1 |
| Portugal | .. | .. | 49.5 | 141.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | 9.7 | 51.4 | .. | 7.2 | 5.0 | 2,326.3 | .. | 100.0 | .. | 23.4 | .. | 1,025.0 |
| Russian Federation | .. | .. | .. | 12.3 | 452.6 | 6,328.2 | 1,100.0 | 2,281.3 | .. | 515.4 | .. | 108.0 |



5.1 | Private sector development

| | Private fixed investment | | Domestic credit to private sector | | Investment in infrastructure projects with private participation ^a | | | | | | | |
|-----------------------|--------------------------------------|-------------------|-----------------------------------|-------|-------------------------------------------------------------------------------|-----------|-----------------------|-----------|--------------------------|-----------|-------------------------------------|-----------|
| | % of gross domestic fixed investment | | % of GDP | | Telecommunications \$ millions | | Energy \$ millions | | Transport \$ millions | | Water and sanitation \$ millions | |
| | 1990 | 1999 | 1990 | 2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 | 1990-94 | 1995-2000 |
| Rwanda | .. | .. | 6.9 | 10.1 | .. | 15.0 | .. | .. | .. | .. | .. | .. |
| Saudi Arabia | .. | .. | 61.0 | 57.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Senegal | .. | .. | 26.5 | 20.0 | .. | 343.3 | .. | 159.0 | .. | .. | .. | 3.7 |
| Sierra Leone | .. | .. | 2.4 | 2.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Singapore | .. | .. | 97.4 | 110.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Slovak Republic | .. | .. | .. | 31.0 | 109.2 | 1,451.5 | .. | .. | .. | .. | .. | .. |
| Slovenia | .. | .. | 34.9 | 38.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| Somalia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 65.6 | 69.0 | 81.0 | 141.9 | 542.2 | 7,818.3 | .. | 18.9 | .. | 1,390.1 | .. | 209.3 |
| Spain | .. | .. | 79.6 | 101.6 | .. | .. | .. | .. | .. | .. | .. | .. |
| Sri Lanka | .. | .. | 19.6 | 28.9 | 43.6 | 1,390.6 | .. | 265.0 | .. | 240.0 | .. | .. |
| Sudan | .. | .. | 4.8 | 2.4 | .. | 6.0 | .. | .. | .. | .. | .. | .. |
| Swaziland | .. | .. | 21.7 | 14.2 | .. | 10.0 | .. | .. | .. | .. | .. | .. |
| Sweden | .. | .. | 128.4 | 46.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Switzerland | .. | .. | 167.9 | 165.2 | .. | .. | .. | .. | .. | .. | .. | .. |
| Syrian Arab Republic | .. | .. | 7.5 | 9.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Tajikistan | .. | .. | .. | .. | .. | 1.0 | .. | .. | .. | .. | .. | .. |
| Tanzania | .. | .. | 13.9 | 4.6 | 1.8 | 66.9 | 6.0 | 150.0 | .. | 23.0 | .. | .. |
| Thailand | 84.8 | 67.7 | 83.4 | 108.8 | 3,664.0 | 4,143.7 | 674.8 | 6,990.4 | 695.9 | 1,759.4 | .. | 260.5 |
| Togo | .. | .. | 22.6 | 17.0 | .. | 5.0 | .. | .. | .. | .. | .. | .. |
| Trinidad and Tobago | 85.2 | 67.8 | 44.7 | 45.5 | 47.0 | 146.7 | .. | 207.0 | .. | .. | .. | 120.0 |
| Tunisia | 64.1 | 52.2 | 55.1 | 66.2 | .. | .. | 627.0 | 265.0 | .. | .. | .. | .. |
| Turkey | 69.2 | 72.0 | 16.7 | 23.7 | 74.0 | 7,794.7 | 718.0 | 6,567.2 | .. | 724.8 | .. | 942.0 |
| Turkmenistan | .. | .. | .. | 1.5 | .. | .. | .. | .. | .. | .. | .. | .. |
| Uganda | .. | .. | 4.0 | 6.3 | 16.0 | 129.8 | .. | .. | .. | .. | .. | .. |
| Ukraine | .. | .. | 2.6 | 10.6 | 90.0 | 1,154.9 | .. | .. | .. | .. | .. | .. |
| United Arab Emirates | .. | .. | 37.4 | 60.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| United Kingdom | 87.3 ^b | 93.6 ^b | 116.0 | 135.1 | .. | .. | .. | .. | .. | .. | .. | .. |
| United States | .. | .. | 93.1 | 143.5 | .. | .. | .. | .. | .. | .. | .. | .. |
| Uruguay | 68.0 | 72.5 | 32.4 | 51.3 | 13.0 | 63.7 | .. | 246.0 | 96.0 | 20.0 | 10.0 | .. |
| Uzbekistan | .. | 34.0 | .. | .. | 2.5 | 357.4 | .. | .. | .. | .. | .. | .. |
| Venezuela, RB | 34.8 | 56.1 | 25.4 | 12.1 | 4,185.7 | 5,574.0 | .. | 133.0 | 100.0 | 268.0 | .. | 25.0 |
| Vietnam | .. | .. | 2.5 | 35.1 | .. | .. | .. | 435.5 | 10.0 | 70.0 | .. | 208.8 |
| West Bank and Gaza | .. | .. | .. | .. | .. | 155.0 | .. | 150.0 | .. | .. | .. | .. |
| Yemen, Rep. | .. | .. | 6.1 | 5.5 | 25.0 | .. | .. | .. | .. | 190.0 | .. | .. |
| Yugoslavia, Fed. Rep. | .. | 87.7 | .. | .. | .. | 1,929.5 | .. | .. | .. | .. | .. | .. |
| Zambia | .. | .. | 8.9 | 9.5 | .. | 57.8 | .. | 289.4 | .. | .. | .. | .. |
| Zimbabwe | .. | .. | 23.0 | 25.2 | .. | 46.0 | .. | 1,180.0 | 18.0 | 70.0 | .. | .. |

| World | 78.1 w | .. w | 97.1 w | 119.5 w | .. s | .. s | .. s | .. s | .. s | .. s | .. s | .. s |
|--------------------------------|--------|------|--------|---------|----------|-----------|----------|-----------|----------|----------|---------|----------|
| Low income | 48.1 | 53.7 | 26.5 | 23.9 | 2,136.3 | 25,684.6 | 4,400.7 | 30,576.0 | 895.5 | 4,666.5 | 27.8 | 2,020.1 |
| Middle income | 72.2 | 74.8 | 45.4 | 61.1 | 44,913.0 | 201,894.1 | 34,676.5 | 145,020.8 | 25,098.2 | 82,513.2 | 8,545.7 | 29,160.4 |
| Lower middle income | .. | .. | .. | 78.4 | 8,623.7 | 49,147.5 | 16,226.6 | 60,579.5 | 7,468.5 | 23,123.0 | 42.8 | 14,728.0 |
| Upper middle income | 73.8 | 77.9 | 38.9 | 48.4 | 36,289.3 | 152,746.6 | 18,449.9 | 84,441.4 | 17,629.7 | 59,390.2 | 8,502.9 | 14,432.4 |
| Low & middle income | 64.5 | 66.9 | 41.6 | 55.3 | 47,049.3 | 227,578.7 | 39,077.2 | 175,596.8 | 25,993.7 | 87,179.7 | 8,573.5 | 31,180.5 |
| East Asia & Pacific | 63.3 | 50.2 | 71.4 | 106.1 | 9,433.9 | 46,365.0 | 16,698.0 | 46,980.3 | 10,094.8 | 35,946.2 | 4,023.3 | 9902.3 |
| Europe & Central Asia | .. | .. | .. | 20.7 | 3,119.7 | 52,507.6 | 2,174.0 | 18,448.3 | 1,089.1 | 3,257.9 | 16.0 | 2577.5 |
| Latin America & Carib. | 74.3 | 79.8 | 28.4 | 27.5 | 32,954.4 | 99,165.1 | 13,025.5 | 82,102.2 | 14,634.1 | 43,104.5 | 4,510.2 | 12,784.3 |
| Middle East & N. Africa | .. | .. | 41.6 | 47.0 | 118.0 | 6,728.6 | 3,131.5 | 7,793.9 | .. | 1,220.3 | .. | 4,105.9 |
| South Asia | 55.9 | 71.8 | 24.6 | 28.7 | 837.8 | 12,131.1 | 3,909.3 | 16,180.5 | 126.9 | 1,714.0 | .. | 216.0 |
| Sub-Saharan Africa | .. | .. | 42.5 | 66.0 | 585.5 | 10,681.3 | 138.9 | 4,091.6 | 48.8 | 1,936.8 | 24.0 | 1,594.5 |
| High income | 81.9 | .. | 107.8 | 136.3 | .. | .. | .. | .. | .. | .. | .. | .. |
| Europe EMU | .. | .. | 78.4 | 97.7 | .. | .. | .. | .. | .. | .. | .. | .. |

a. Data refer to total for the period shown. For differences in concepts and definitions between proceeds from privatization and Investment in infrastructure projects with private participation see *About the data*. b. Data refer to investment by both private and public corporations. c. Data refer to investment by individuals, shareholding units, jointly owned units, collectively owned units, foreign-funded units, and units in Hong Kong, China; Macao, China; and Taiwan, China.



About the data

Private sector development, that is, tapping private sector initiative for socially useful purposes, is critical for poverty reduction. Private initiative, especially in competitive markets, has tremendous potential to contribute to growth in parallel with public sector efforts. Private markets are the engine of productivity growth, creating productive jobs and higher incomes, and along with the complementary government role of regulation, funding, and provision, private initiative can help to provide the basic services and conditions that empower the poor by improving infrastructure, health and education. More than 130 developing countries introduced private participation in at least one infrastructure sector between 1990 and 2000 involving over 2,330 projects with investment commitments of \$693 billion.

Private fixed investment consists of outlays for additions to fixed assets—improvements to land, construction of infrastructure and buildings, and purchases of plant, machinery, and equipment—by the private sector. When direct estimates of private investment are unavailable, private fixed investment is estimated as the difference between total gross fixed investment and consolidated public investment. Total investment may be estimated directly from surveys of enterprises and administrative records, or indirectly using the commodity flow method. Consolidated measures of public investment may omit important subnational units of government and in some cases may include financial as well as physical capital investment. As the difference between two estimated quantities, private fixed investment may be undervalued or overvalued and subject to large errors over time. When private domestic investment accounts for a large share of total investment, it may reflect a highly competitive and efficient private sector—or one that is subsidized and protected.

This concept of private investment is the one used by the International Finance Corporation (IFC) in its *Trends in Private Investment in Developing Countries 2001*, the source of data for most countries in the table. But for other countries, most notably members of the Organisation for Economic Co-operation and Development (OECD), the concepts and definitions of the 1993 System of National Accounts (SNA) are used. Since IFC data conform to the concepts and definitions of the 1968 SNA, the data are not strictly comparable. While the IFC data on private investment represent only the capital expenditure decisions of the private sector, in the 1993 SNA the term *fixed capital formation by households and corporations* includes capital expenditures by both private and public corporations. Countries reporting on this basis are footnoted in the table. (For further discussion on measuring gross capital formation see *About the data* for table 4.9.)

The data on domestic credit to the private sector are taken from the banking survey of the International Monetary Fund's (IMF) *International Financial Statistics* or, when data are unavailable, from its monetary survey. The monetary survey includes monetary authorities (the central bank) and deposit money banks. In addition to these, the banking survey includes other banking institutions, such as savings and loan institutions, finance companies, and development banks. In some cases credit to the private sector may include credit to state-owned or partially state-owned enterprises.

Private participation in infrastructure has made important contributions to easing fiscal restraints and to improving the efficiency of infrastructure services and in extending their delivery to poor people. The privatization trend in infrastructure that began in the 1970s and 1980s took off in the 1990s. Developing countries have been at the head of this wave, pioneering better approaches to providing infrastructure services and reaping the benefits of increased competition and customer focus.

The data on investment in infrastructure projects with private participation refer to all investment (public and private) in projects in which a private company assumes operating risk during the operating period or assumes development and operating risk during the contract period. Foreign state-owned companies are considered private entities for the purposes of this measure. The data are from the World Bank's PPI Project Database, which tracks about 2,330 projects, newly owned or managed by private companies, that reached financial closure in low- and middle-income economies in 1990–2000. For more information go to www.worldbank.org/html/fpd/privatesector/PPIDBweb/Intro.htm.

Definitions

- **Private fixed investment** covers gross outlays by the private sector (including private nonprofit agencies) on additions to its fixed domestic assets. Gross domestic fixed investment includes similar outlays by the public sector. No allowance is made for the depreciation of assets.
- **Domestic credit to private sector** refers to financial resources provided to the private sector—such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable—that establish a claim for repayment. For some countries these claims include credit to public enterprises.
- **Investment in infrastructure projects with private participation** covers infrastructure projects in telecommunications, energy (electricity and natural gas transmission and distribution), transport, and water and sanitation that have reached financial closure and directly or indirectly serve the public. Movable assets, incinerators, standalone solid waste projects, and small projects such as windmills are excluded. The types of projects included are operations and management contracts, operations and management contracts with major capital expenditure, greenfield projects (in which a private entity or a public-private joint venture builds and operates a new facility), and divestiture.

Data sources

The data on private investment are from the International Finance Corporation's *Trends in Private Investment in Developing Countries 2001*, OECD data files (see OECD, *National Accounts, 1960–99*, volumes 1 and 2), and World Bank estimates. The data on domestic credit are from the IMF's *International Financial Statistics*. The data on investment in infrastructure projects with private participation are from the World Bank's Private Participation in Infrastructure (PPI) Project Database (www.worldbank.org/html/fpd/privatesector/PPIDBweb/Intro.htm).



5.2 | Investment climate

| | Foreign direct investment | | Entry and exit regulation ^a | | | Composite ICRG risk rating ^b | Institutional Investor credit rating ^b | Euromoney country credit-worthiness rating ^b | Moody's sovereign long-term debt rating ^b | | Standard & Poor's sovereign long-term debt rating ^b | |
|--------------------------|------------------------------|------|----------------------------------------|------------------------------------|------|-----------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------------|--------------------------------|----------------------------------------------------------------|--------------------------------|
| | % of gross capital formation | | Entry 2000 | Repatriation of income and capital | | December 2001 | September 2001 | September 2001 | Foreign currency January 2002 | Domestic currency January 2002 | Foreign currency January 2002 | Domestic currency January 2002 |
| | 1990 | 2000 | | 2000 | 2000 | | | | | | | |
| Afghanistan | .. | .. | .. | .. | .. | .. | 5.9 | 1.3 | .. | .. | .. | .. |
| Albania | 0.0 | 20.5 | .. | .. | .. | 62.5 | 12.1 | 26.5 | .. | .. | .. | .. |
| Algeria | 0.0 | 0.1 | .. | .. | .. | 62.3 | 30.6 | 38.6 | .. | .. | .. | .. |
| Angola | -27.9 | 68.1 | .. | .. | .. | 50.5 | 12.1 | 20.1 | .. | .. | .. | .. |
| Argentina | 9.3 | 25.7 | F | F | F | 64.8 | 34.7 | 43.4 | Ca | Ca | SD | SD |
| Armenia | .. | 38.2 | .. | .. | .. | 59.8 | .. | 30.5 | .. | .. | .. | .. |
| Australia | 11.9 | 5.8 | .. | .. | .. | 81.5 | 80.4 | 88.4 | Aa2 | Aaa | AA+ | AAA |
| Austria | 1.6 | 6.0 | .. | .. | .. | 86.5 | 87.7 | 92.4 | Aaa | Aaa | AAA | AAA |
| Azerbaijan | .. | 9.6 | .. | .. | .. | 68.5 | .. | 32.3 | .. | .. | .. | .. |
| Bangladesh | 0.1 | 2.6 | F | F | F | 60.5 | 26.4 | 36.5 | .. | .. | .. | .. |
| Belarus | .. | 1.3 | .. | .. | .. | 61.3 | 12.5 | 24.4 | .. | .. | .. | .. |
| Belgium | 13.6 | 36.7 | .. | .. | .. | 84.0 | 86.6 | 90.5 | Aa1 | Aa1 | AA+ | AA+ |
| Benin | 0.4 | 7.0 | .. | .. | .. | .. | 18.5 | 25.1 | .. | .. | .. | .. |
| Bolivia | 4.4 | 48.6 | .. | .. | .. | 66.3 | 30.8 | 39.3 | B1 | B1 | B+ | BB |
| Bosnia and Herzegovina | .. | 0.0 | .. | .. | .. | .. | .. | 23.9 | .. | .. | .. | .. |
| Botswana | 8.0 | 3.7 | F | F | F | 78.5 | 56.7 | 60.7 | A2 | A1 | A | A+ |
| Brazil | 1.1 | 26.9 | F | F | F | 62.5 | 42.1 | 48.7 | B1 | B1 | BB- | BB+ |
| Bulgaria | 0.1 | 50.4 | F | F | F | 72.3 | 36.6 | 44.5 | B2 | B1 | BB- | BB |
| Burkina Faso | 0.0 | 1.7 | .. | .. | .. | 60.5 | 16.1 | 29.3 | .. | .. | .. | .. |
| Burundi | 0.6 | 19.0 | .. | .. | .. | .. | 10.5 | 22.8 | .. | .. | .. | .. |
| Cambodia | 0.0 | 26.3 | .. | .. | .. | .. | .. | 26.9 | .. | .. | .. | .. |
| Cameroon | -5.7 | 2.1 | .. | .. | .. | 64.0 | 17.0 | 29.7 | .. | .. | .. | .. |
| Canada | 6.4 | 19.7 | .. | .. | .. | 84.8 | 87.2 | 89.9 | Aa1 | Aa1 | AA+ | AAA |
| Central African Republic | 0.5 | 4.8 | .. | .. | .. | .. | .. | 24.2 | .. | .. | .. | .. |
| Chad | 0.0 | 6.3 | .. | .. | .. | .. | 11.9 | 23.1 | .. | .. | .. | .. |
| Chile | 7.7 | 22.2 | R | F | F | 76.3 | 64.2 | 64.6 | Baa1 | A1 | A- | AA |
| China | 2.8 | 9.5 | S | F | F | 74.3 | 57.4 | 60.7 | A3 | .. | BBB | .. |
| Hong Kong, China | .. | .. | .. | .. | .. | 83.3 | 65.2 | 80.4 | A3 | Aa3 | A+ | AA- |
| Colombia | 6.7 | 23.9 | A | F | F | 58.8 | 38.8 | 48.4 | Ba2 | Baa2 | BB | BBB |
| Congo, Dem. Rep. | -1.4 | .. | .. | .. | .. | 50.3 | 7.5 | 6.5 | .. | .. | .. | .. |
| Congo, Rep. | 0.0 | 1.8 | .. | .. | .. | 57.5 | 8.7 | 23.4 | .. | .. | .. | .. |
| Costa Rica | 10.4 | 15.1 | .. | .. | .. | 74.0 | 44.1 | 50.7 | Ba1 | Ba1 | BB | BB+ |
| Côte d'Ivoire | 6.6 | 9.2 | F | F | F | 57.5 | 18.5 | 29.5 | .. | .. | .. | .. |
| Croatia | .. | 22.1 | F | F | F | 75.0 | 43.9 | 53.5 | Baa3 | Baa1 | BBB- | BBB+ |
| Cuba | .. | .. | .. | .. | .. | 64.5 | 13.7 | 6.7 | Caa1 | .. | .. | .. |
| Czech Republic | 2.4 | 30.4 | F | F | F | 75.8 | 60.5 | 63.0 | Baa1 | A1 | A- | AA- |
| Denmark | 4.2 | 95.4 | .. | .. | .. | 87.3 | 88.4 | 94.7 | Aaa | Aaa | AAA | AAA |
| Dominican Republic | 7.5 | 20.4 | .. | .. | .. | 70.3 | 35.0 | 41.9 | Ba2 | Ba2 | BB- | BB- |
| Ecuador | 6.7 | 31.1 | F | F | F | 60.8 | 19.0 | 30.1 | Caa2 | Caa1 | CCC+ | CCC+ |
| Egypt, Arab Rep. | 5.9 | 5.2 | F | F | F | 68.8 | 47.1 | 52.6 | Ba1 | Baa1 | BBB- | BBB+ |
| El Salvador | 0.3 | 8.3 | .. | .. | .. | 73.5 | 41.9 | 49.1 | Baa3 | Baa2 | BB+ | BB+ |
| Eritrea | .. | 15.2 | .. | .. | .. | .. | .. | 21.4 | .. | .. | .. | .. |
| Estonia | 7.2 | 30.2 | F | F | F | 75.0 | 55.0 | 59.3 | Baa1 | A1 | A- | A- |
| Ethiopia | 1.5 | 5.5 | .. | .. | .. | 60.5 | 14.7 | 25.8 | .. | .. | .. | .. |
| Finland | 2.0 | 38.0 | .. | .. | .. | 88.3 | 85.9 | 92.3 | Aaa | Aaa | AA+ | AA+ |
| France | 4.6 | 16.2 | .. | .. | .. | 81.0 | 92.0 | 92.3 | Aaa | Aaa | AAA | AAA |
| Gabon | 5.7 | 11.6 | .. | .. | .. | 69.3 | 21.0 | 30.8 | .. | .. | .. | .. |
| Gambia, The | 0.0 | 19.2 | .. | .. | .. | 68.8 | .. | 27.3 | .. | .. | .. | .. |
| Georgia | 0.0 | 29.8 | .. | .. | .. | .. | 15.4 | 25.6 | .. | .. | .. | .. |
| Germany | 0.7 | 44.6 | .. | .. | .. | 83.8 | 92.8 | 92.2 | Aaa | Aaa | AAA | AAA |
| Ghana | 1.8 | 8.9 | F | F | F | 59.5 | 25.4 | 35.2 | .. | .. | .. | .. |
| Greece | 5.2 | 2.0 | F | F | F | 74.0 | 71.2 | 82.0 | A2 | A2 | A | A |
| Guatemala | 4.6 | 7.2 | .. | .. | .. | 70.3 | 31.4 | 42.3 | Ba2 | Ba1 | BB | BB+ |
| Guinea | 3.6 | 9.5 | .. | .. | .. | 61.8 | 15.8 | 23.9 | .. | .. | .. | .. |
| Guinea-Bissau | 2.7 | 7.9 | .. | .. | .. | 48.0 | .. | 20.7 | .. | .. | .. | .. |
| Haiti | 2.2 | 3.0 | .. | .. | .. | 57.3 | 12.1 | 25.0 | .. | .. | .. | .. |
| Honduras | 6.3 | 13.6 | .. | .. | .. | 64.8 | 22.5 | 36.6 | B2 | B2 | .. | .. |



| | Foreign direct investment | | Entry and exit regulation ^a | | | Composite ICRG risk rating ^b | Institutional Investor credit rating ^b | Euromoney country credit-worthiness rating ^b | Moody's sovereign long-term debt rating ^b | | Standard & Poor's sovereign long-term debt rating ^b | |
|--------------------|------------------------------|-------|----------------------------------------|------------------------------------|------|-----------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------------|--------------------------------|----------------------------------------------------------------|--------------------------------|
| | % of gross capital formation | | Entry 2000 | Repatriation of income and capital | | December 2001 | September 2001 | September 2001 | Foreign currency January 2002 | Domestic currency January 2002 | Foreign currency January 2002 | Domestic currency January 2002 |
| | 1990 | 2000 | | 2000 | 2000 | | | | | | | |
| Hungary | 0.0 | 12.1 | F | F | F | 76.0 | 62.0 | 70.2 | A3 | A1 | A- | A+ |
| India | 0.2 | 2.1 | A | F | F | 65.3 | 47.4 | 55.0 | Ba2 | Ba2 | BB | BBB- |
| Indonesia | 3.1 | -16.6 | R | RS | RS | 56.3 | 21.6 | 33.4 | B3 | B3 | CCC | B- |
| Iran, Islamic Rep. | -1.1 | 0.2 | .. | .. | .. | 69.3 | 31.5 | 41.3 | B2 | Ba2 | .. | .. |
| Iraq | .. | .. | .. | .. | .. | 47.3 | 9.0 | 3.3 | .. | .. | .. | .. |
| Ireland | 6.3 | 85.4 | .. | .. | .. | 88.8 | 83.8 | 91.1 | Aaa | Aaa | AAA | AAA |
| Israel | 1.1 | 20.6 | F | F | F | 67.8 | 60.0 | 72.0 | A2 | A2 | A- | AA- |
| Italy | 2.6 | 6.0 | .. | .. | .. | 81.8 | 82.9 | 87.5 | Aa3 | Aa3 | AA | AA |
| Jamaica | 11.7 | 23.0 | R | F | F | 70.3 | 27.8 | 39.8 | Ba3 | Baa3 | B+ | BB- |
| Japan | 0.2 | 1.1 | .. | .. | .. | 84.3 | 86.2 | 89.9 | Aa1 | Aa3 | AA | AA |
| Jordan | 3.0 | 33.0 | F | F | F | 71.0 | 38.8 | 46.5 | Ba3 | Ba3 | BB- | BBB- |
| Kazakhstan | 1.2 | 49.2 | .. | .. | .. | 72.0 | 33.9 | 43.6 | Ba2 | Ba1 | BB | BB+ |
| Kenya | 3.4 | 8.4 | R | F | F | 61.0 | 21.7 | 35.8 | .. | .. | .. | .. |
| Korea, Dem. Rep. | .. | .. | .. | .. | .. | 47.5 | 7.0 | 3.9 | .. | .. | .. | .. |
| Korea, Rep. | 0.8 | 7.1 | R | F | F | 79.3 | 61.7 | 62.4 | Baa2 | Baa1 | BBB+ | A+ |
| Kuwait | .. | 0.4 | .. | .. | .. | 84.0 | 63.6 | 75.8 | Baa1 | .. | A | A+ |
| Kyrgyz Republic | 0.0 | -1.1 | .. | .. | .. | .. | 17.5 | 25.1 | .. | .. | .. | .. |
| Lao PDR | .. | 20.6 | .. | .. | .. | .. | .. | 25.0 | .. | .. | .. | .. |
| Latvia | 1.1 | 21.0 | F | F | F | 76.0 | 48.0 | 52.6 | Baa2 | A2 | BBB | A- |
| Lebanon | 1.2 | 10.0 | F | F | F | 56.8 | 31.6 | 44.7 | B2 | B3 | B | B |
| Lesotho | 5.2 | 32.5 | .. | .. | .. | .. | 23.9 | 34.5 | .. | .. | .. | .. |
| Liberia | .. | .. | .. | .. | .. | 49.8 | 7.6 | 12.5 | .. | .. | .. | .. |
| Libya | .. | .. | .. | .. | .. | 73.8 | 31.3 | 18.0 | .. | .. | .. | .. |
| Lithuania | 0.0 | 16.2 | F | F | F | 74.0 | 45.5 | 50.6 | Ba1 | Baa1 | BBB- | BBB+ |
| Macedonia, FYR | .. | 29.4 | .. | .. | .. | .. | .. | 25.4 | .. | .. | .. | .. |
| Madagascar | 4.2 | 13.3 | .. | .. | .. | 67.0 | .. | 27.9 | .. | .. | .. | .. |
| Malawi | 0.0 | 20.3 | .. | .. | .. | 60.0 | 17.9 | 26.1 | .. | .. | .. | .. |
| Malaysia | 16.4 | 7.2 | R | F | D | 76.0 | 56.4 | 59.8 | Baa2 | A3 | BBB | A |
| Mali | -1.3 | 14.6 | .. | .. | .. | 57.8 | 16.1 | 28.9 | .. | .. | .. | .. |
| Mauritania | 3.4 | 1.8 | .. | .. | .. | .. | .. | 22.1 | .. | .. | .. | .. |
| Mauritius | 5.0 | 23.6 | R | F | F | .. | 53.9 | 57.4 | Baa2 | A2 | .. | .. |
| Mexico | 4.3 | 9.9 | F | F | F | 70.8 | 55.3 | 60.4 | Baa3 | Baa1 | BB+ | BBB+ |
| Moldova | 0.0 | 44.7 | .. | .. | .. | 63.8 | 16.2 | 26.0 | Caa1 | Caa1 | .. | .. |
| Mongolia | .. | 10.4 | .. | .. | .. | 64.3 | .. | 28.4 | .. | .. | B | B |
| Morocco | 2.5 | 0.1 | F | F | F | 71.8 | 45.4 | 55.2 | Ba1 | Ba1 | BB | BBB |
| Mozambique | 2.3 | 11.0 | .. | .. | .. | 59.0 | 18.1 | 30.0 | .. | .. | .. | .. |
| Myanmar | .. | .. | .. | .. | .. | 62.0 | 13.4 | 23.9 | .. | .. | .. | .. |
| Namibia | .. | .. | F | F | F | 76.3 | 39.1 | 22.8 | .. | .. | .. | .. |
| Nepal | 0.9 | 0.3 | .. | .. | .. | .. | 27.5 | 30.1 | .. | .. | .. | .. |
| Netherlands | 15.2 | 48.1 | .. | .. | .. | 87.0 | 92.6 | 93.2 | Aaa | Aaa | AAA | AAA |
| New Zealand | 21.3 | 12.5 | .. | .. | .. | 80.3 | 75.9 | 85.2 | Aa2 | Aaa | AA+ | AAA |
| Nicaragua | 0.0 | 30.8 | .. | .. | .. | 57.8 | 18.9 | 28.7 | B2 | B2 | .. | .. |
| Niger | -0.5 | 7.7 | .. | .. | .. | 59.5 | 13.1 | 28.2 | .. | .. | .. | .. |
| Nigeria | 14.0 | 11.6 | R | F | F | 57.3 | 18.3 | 28.8 | .. | .. | .. | .. |
| Norway | 3.7 | 16.4 | .. | .. | .. | 92.3 | 90.0 | 95.3 | Aaa | Aaa | AAA | AAA |
| Oman | 10.2 | .. | F | F | F | 81.8 | 55.4 | 60.7 | Baa2 | Baa2 | BBB | BBB+ |
| Pakistan | 3.2 | 3.2 | F | F | F | 56.0 | 18.1 | 34.5 | Caa1 | Caa1 | B- | B+ |
| Panama | 14.8 | 20.2 | .. | .. | .. | 71.5 | 46.4 | 52.7 | Ba1 | .. | BB | BB |
| Papua New Guinea | 19.7 | 46.3 | .. | .. | .. | 61.8 | 28.5 | 37.3 | B1 | B1 | B | BB- |
| Paraguay | 6.3 | 4.9 | .. | .. | .. | 63.0 | 28.9 | 38.8 | B2 | B1 | B | BB- |
| Peru | 0.9 | 6.3 | F | F | F | 68.8 | 34.7 | 47.9 | Ba3 | Baa3 | BB- | BB+ |
| Philippines | 5.0 | 15.2 | S | F | F | 70.0 | 43.5 | 53.1 | Ba1 | Baa3 | BB+ | BBB+ |
| Poland | 0.6 | 22.3 | F | F | F | 75.3 | 59.2 | 59.6 | Baa1 | A2 | BBB+ | A+ |
| Portugal | 13.2 | 21.1 | .. | .. | .. | 78.3 | 79.8 | 84.7 | Aa2 | Aa2 | AA | AA |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | 0.0 | 14.4 | F | F | F | 64.3 | 29.1 | 40.5 | B2 | B2 | B | B+ |
| Russian Federation | 0.0 | 6.3 | F | F | F | 69.5 | 26.8 | 37.4 | Ba3 | Ba2 | B+ | B+ |



5.2 | Investment climate

| | Foreign direct investment | | Entry and exit regulation ^a | | | Composite ICRG risk rating ^b | Institutional Investor credit rating ^b | Euromoney country credit-worthiness rating ^b | Moody's sovereign long-term debt rating ^b | | Standard & Poor's sovereign long-term debt rating ^b | |
|--------------------------------|------------------------------|---------------|----------------------------------------|------------------------------------|------|-----------------------------------------|---------------------------------------------------|---------------------------------------------------------|------------------------------------------------------|--------------------------------|----------------------------------------------------------------|--------------------------------|
| | % of gross capital formation | | Entry 2000 | Repatriation of income and capital | | December 2001 | September 2001 | September 2001 | Foreign currency January 2002 | Domestic currency January 2002 | Foreign currency January 2002 | Domestic currency January 2002 |
| | 1990 | 2000 | | 2000 | 2000 | | | | | | | |
| Rwanda | 2.1 | 5.2 | .. | .. | .. | .. | .. | 21.4 | .. | .. | .. | .. |
| Saudi Arabia ^c | .. | .. | C | RS | RS | 77.3 | 58.8 | 67.2 | Baa3 | Ba1 | .. | .. |
| Senegal | 7.2 | 12.3 | .. | .. | .. | 66.3 | 23.7 | 32.5 | .. | .. | B+ | B+ |
| Sierra Leone | 37.9 | 2.0 | .. | .. | .. | 48.5 | 8.3 | 24.0 | .. | .. | .. | .. |
| Singapore | 41.5 | 22.1 | .. | .. | .. | 89.3 | 84.8 | 90.5 | Aa1 | Aaa | AAA | AAA |
| Slovak Republic | 0.0 | 35.7 | F | F | F | 73.3 | 47.7 | 53.7 | Baa3 | A3 | BBB- | A- |
| Slovenia | 5.0 | 3.5 | R | F | F | 78.8 | 64.9 | 73.8 | A2 | Aa3 | A | AA |
| Somalia | 4.2 | .. | .. | .. | .. | 43.5 | .. | 11.0 | .. | .. | .. | .. |
| South Africa | .. | 5.1 | F | F | F | 68.8 | 49.5 | 57.7 | Baa2 | A2 | BBB- | A- |
| Spain | 10.2 | 24.9 | .. | .. | .. | 80.5 | 82.8 | 87.8 | Aaa | Aaa | AA+ | AA+ |
| Sri Lanka | 2.4 | 3.8 | R | RS | F | 57.0 | 33.9 | 39.0 | .. | .. | .. | .. |
| Sudan | .. | 23.8 | .. | .. | .. | 54.0 | 9.1 | 22.8 | .. | .. | .. | .. |
| Swaziland | 17.8 | -15.1 | .. | .. | .. | .. | 27.0 | 34.3 | .. | .. | .. | .. |
| Sweden | 3.6 | 54.4 | .. | .. | .. | 84.3 | 85.7 | 92.6 | Aa1 | Aaa | AA+ | AAA |
| Switzerland | 9.3 | 23.1 | .. | .. | .. | 92.5 | 93.8 | 98.2 | Aaa | Aaa | AAA | AAA |
| Syrian Arab Republic | 3.5 | 3.2 | .. | .. | .. | 71.5 | 22.0 | 36.4 | .. | .. | .. | .. |
| Tajikistan | 0.0 | 12.2 | .. | .. | .. | .. | 11.9 | 25.1 | .. | .. | .. | .. |
| Tanzania | 0.0 | 12.1 | .. | .. | .. | 57.5 | 20.6 | 31.7 | .. | .. | .. | .. |
| Thailand | 6.9 | 12.2 | R | F | F | 73.8 | 50.0 | 56.7 | Baa3 | Baa1 | BBB- | A- |
| Togo | 0.0 | 12.0 | .. | .. | .. | 61.0 | 14.6 | 25.6 | .. | .. | .. | .. |
| Trinidad and Tobago | 17.1 | 46.5 | R | F | F | 73.5 | 49.2 | 52.8 | Baa3 | Baa1 | BBB- | BBB+ |
| Tunisia | 1.9 | 14.1 | F | F | F | 72.8 | 50.8 | 56.8 | Baa3 | Baa2 | BBB | A |
| Turkey | 1.9 | 2.1 | F | F | F | 48.5 | 34.4 | 43.7 | B1 | B3 | B- | B- |
| Turkmenistan | .. | 10.0 | .. | .. | .. | .. | 16.6 | 25.5 | B2 | .. | .. | .. |
| Uganda | 0.0 | 19.6 | .. | .. | .. | 62.5 | 21.4 | 34.6 | .. | .. | .. | .. |
| Ukraine | 0.0 | 10.0 | F | F | F | 66.8 | 17.5 | 30.0 | Caa1 | Caa1 | B | B |
| United Arab Emirates | .. | .. | .. | .. | .. | 82.5 | 68.3 | 79.3 | A2 | .. | .. | .. |
| United Kingdom | 16.8 | 52.9 | .. | .. | .. | 83.5 | 91.5 | 92.1 | Aaa | Aaa | AAA | AAA |
| United States | 4.8 | 15.8 | .. | .. | .. | 79.0 | 91.6 | 93.5 | Aaa | Aaa | AAA | AAA |
| Uruguay | 0.0 | 10.9 | .. | .. | .. | 74.3 | 49.5 | 57.0 | Baa3 | Baa3 | BBB- | BBB+ |
| Uzbekistan | 1.5 | 11.8 | .. | .. | .. | .. | 16.7 | 28.3 | .. | .. | .. | .. |
| Venezuela, RB | 9.1 | 21.1 | F | F | F | 66.8 | 33.3 | 44.7 | B2 | B3 | B | .. |
| Vietnam | 1.9 | 15.1 | .. | .. | .. | 69.5 | 30.0 | 40.7 | B1 | .. | .. | .. |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | -18.6 | -12.3 | .. | .. | .. | 65.3 | .. | 30.1 | .. | .. | .. | .. |
| Yugoslavia, Fed. Rep. | .. | 0.0 | .. | .. | .. | 46.0 | 12.2 | 16.7 | .. | .. | .. | .. |
| Zambia | 35.7 | 37.6 | .. | .. | .. | 53.5 | 16.0 | 26.5 | .. | .. | .. | .. |
| Zimbabwe | -0.8 | 8.5 | R | F | F | 39.0 | 13.0 | 23.2 | .. | .. | .. | .. |
| World | 4.1 w | 14.0 w | | | | 69.1 m | 33.9 m | 38.8 m | | | | |
| Low income | 1.3 | 3.4 | | | | 59.8 | 16.2 | 26.5 | | | | |
| Middle income | 2.5 | 12.2 | | | | 70.3 | 38.8 | 45.6 | | | | |
| Lower middle income | 1.9 | 9.5 | | | | 69.4 | 31.5 | 39.5 | | | | |
| Upper middle income | 3.3 | 14.6 | | | | 73.8 | 49.5 | 57.2 | | | | |
| Low & middle income | 2.3 | 10.9 | | | | 64.8 | 27.0 | 32.5 | | | | |
| East Asia & Pacific | 3.5 | 8.2 | | | | 69.5 | 36.8 | 37.3 | | | | |
| Europe & Central Asia | 0.4 | 13.6 | | | | 70.8 | 29.1 | 32.3 | | | | |
| Latin America & Carib. | 3.8 | 19.1 | | | | 67.8 | 34.7 | 44.1 | | | | |
| Middle East & N. Africa | 2.2 | 2.7 | | | | 71.0 | 35.2 | 44.7 | | | | |
| South Asia | 0.5 | 2.3 | | | | 58.8 | 27.0 | 35.5 | | | | |
| Sub-Saharan Africa | .. | 12.2 | | | | 59.5 | 17.5 | 26.3 | | | | |
| High income | 4.5 | 14.2 | | | | 83.7 | 85.3 | 90.2 | | | | |
| Europe EMU | 4.5 | 27.2 | | | | 83.8 | 85.9 | 91.1 | | | | |

a. Entry and exit regulations are classified as free (F), relatively free (R), delayed (D), special classes of shares (S), authorized investors only (A), restricted (RS) and closed (C). For explanations of the terms see *About the data*. b. This copyrighted material is reprinted with permission from the following data providers: PRS Group, 6320 Fly Road, Suite 102, PO Box 248, East Syracuse, NY 13057; Institutional Investor Inc., 488 Madison Avenue, New York, NY 13057; Euromoney Publications PLC, Nestor House, Playhouse Yard, London EC4V 5EX, UK; Moody's Investors Service, 99 Church Street, New York, NY 10007; and Standard & Poor's Rating Services, The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY 10020. Prior written consent from the original data providers cited must be obtained for third-party use of these data. c. Foreigners are barred from investing directly in the Saudi stock market, but they may invest indirectly through mutual funds.



About the data

As investment portfolios become increasingly global, investors as well as governments seeking to attract investment must have a good understanding of trends in foreign direct investment and country risk. This table presents information on foreign direct investment, country risk and creditworthiness ratings from several major international rating services, and information on the regulation of entry to and exit from emerging stock markets reported by Standard & Poor's.

The statistics on foreign direct investment are based on balance of payments data reported by the International Monetary Fund (IMF), supplemented by data on net foreign direct investment reported by the Organisation for Economic Co-operation and Development and official national sources. (For a detailed discussion of data on foreign direct investment see *About the data* for table 6.7.)

Entry and exit restrictions on investments are among the mechanisms by which countries attempt to reduce the risk to their economies associated with foreign investment. Yet such restrictions may increase the risk or uncertainty perceived by investors. Many countries close industries considered strategic to foreign or nonresident investors. And national law or corporate policy may limit foreign investment in a company or in certain classes of stocks.

The entry and exit regulations summarized in the table refer to "new money" investment by foreign institutions; other regulations may apply to capital invested through debt conversion schemes or to capital from other sources. The regulations reflected here are formal ones. But even formal regulations may have very different effects in different countries because of differences in the bureaucratic culture, the speed with which applications are processed, and the extent of red tape. The regulations on entry are evaluated using the terms *free* (no significant restrictions), *relatively free* (some registration procedures required to ensure repatriation rights), *special classes* (foreigners restricted to certain classes of stocks designated for foreign investors), *authorized investors only* (only approved foreign investors may buy stocks), and *closed* (closed or access severely restricted, as for nonresident nationals only). Regulations on repatriation of income and capital are evaluated as *free* (repatriation done routinely) or *restricted* (repatriation requires registration with or permission of a government agency that may restrict the timing of exchange release).

Most risk ratings are numerical or alphabetical indexes, with a higher number or a letter closer to the beginning of the alphabet meaning lower risk (a good prospect). (For more on the rating processes of the rating agencies see the *Data sources*.) Risk ratings may be highly subjective, reflecting external perceptions that do not always capture the actual situation in a coun-

try. But these subjective perceptions are the reality that policy-makers face. Countries not rated by credit risk rating agencies typically do not attract registered flows of private capital. The risk ratings presented here are included for their analytical usefulness and are not endorsed by the World Bank.

The PRS Group's *International Country Risk Guide* (ICRG) collects information on 22 components of risk, groups it into three major categories (political, financial, and economic), and converts it into a single numerical risk assessment ranging from 0 to 100. Ratings below 50 indicate very high risk, and those above 80 very low risk. Ratings are updated monthly.

Institutional Investor country credit ratings are based on information provided by leading international banks. Responses are weighted using a formula that gives more importance to responses from banks with greater worldwide exposure and more sophisticated country analysis systems. Countries are rated on a scale of 0 to 100 (highest risk to lowest), and ratings are updated every six months.

Euromoney country creditworthiness ratings are based on nine weighted categories (covering debt, economic performance, political risk, and access to financial and capital markets) that assess country risk. The ratings, also on a scale of 0 to 100 (highest risk to lowest), are based on polls of economists and political analysts supplemented by quantitative data such as debt ratios and access to capital markets.

Moody's sovereign long-term debt ratings are opinions of the ability of entities to honor senior unsecured financial obligations and contracts denominated in foreign currency (foreign currency issuer ratings) or in their domestic currency (domestic currency issuer ratings).

Standard & Poor's ratings of sovereign long-term foreign and domestic currency debt are based on current information furnished by obligors or obtained by Standard & Poor's from other sources it considers reliable. A Standard & Poor's issuer credit rating (one form of which is a sovereign credit rating) is a current opinion of an obligor's capacity and willingness to pay its financial obligations as they come due (its creditworthiness). This opinion does not apply to any specific financial obligation, as it does not take into account the nature and provisions of obligations, their standing in bankruptcy or liquidation, statutory preferences, or the legality and enforceability of obligations.

Definitions

- **Foreign direct investment** is net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. Gross capital formation (gross domestic investment in previous editions) is the sum of gross fixed capital formation, changes in inventories, and acquisitions less disposals of valuables.
- **Regulations on entry to emerging stock markets** are assessed on a scale from free to closed (see *About the data*).
- **Regulations on repatriation of income** (dividends, interest, and realized capital gains) and repatriation of capital from emerging stock markets are evaluated as free or restricted (see *About the data*).
- **Composite International Country Risk Guide (ICRG) risk rating** is an overall index, ranging from 0 to 100, based on 22 components of risk.
- **Institutional Investor credit rating** ranks, from 0 to 100, the chances of a country's default.
- **Euromoney country creditworthiness rating** ranks, from 0 to 100, the risk of investing in an economy.
- **Moody's sovereign foreign and domestic currency long-term debt rating** assesses the risk of lending to governments. An entity's ability to meet its senior financial obligations is rated from Aaa (offering exceptional financial security) to C (usually in default, with potential recovery values low). Modifiers 1–3 are applied to ratings from Aa to B, with 1 indicating a high ranking in the rating category.
- **Standard & Poor's sovereign foreign and domestic currency long-term debt rating** ranges from AAA (extremely strong capacity to meet financial commitments) through CC (currently highly vulnerable). Ratings from AA to CCC may be modified by a plus or minus sign to show relative standing in the category. An obligor rated SD (selective default) has failed to pay one or more financial obligations when due.

Data sources

The data on foreign direct investment are based on estimates compiled by the IMF in its *Balance of Payments Statistics Yearbook*, supplemented by World Bank staff estimates. The data on entry and exit regulations are from Standard & Poor's *Emerging Stock Markets Factbook 2001*. The country risk and creditworthiness ratings are from the PRS Group's monthly *International Country Risk Guide* (Web site: www.ICRGonline.com), the monthly *Institutional Investor*, the monthly *Euromoney*, Moody's Investors Service's *Sovereign, Subnational and Sovereign-Guaranteed Issuers*, and Standard & Poor's Sovereign List in *Credit Week*.



5.3 | Stock markets

| | Market capitalization | | | | Value traded | | Turnover ratio | | Listed domestic companies | | S&P/IFC Investable Index | |
|--------------------------|-----------------------|-----------|----------|-------|--------------|-------|-----------------------------------------------|------|---------------------------|-------|--------------------------|--------------------|
| | \$ millions | | % of GDP | | % of GDP | | value of shares traded as % of capitalization | | | | % change in price index | |
| | 1990 | 2001 | 1990 | 2000 | 1990 | 2000 | 1990 | 2001 | 1990 | 2001 | 2000 | 2001 |
| Afghanistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Albania | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Algeria | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Angola | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 3,268 | 192,499 | 2.3 | 58.3 | 0.6 | 2.1 | 33.6 | 0.2 | 179 | 111 | -25.1 | -31.7 |
| Armenia | .. | 25 | .. | 1.4 | .. | 0.1 | .. | 4.6 | .. | 95 | .. | .. |
| Australia | 108,879 | 372,794 | 35.2 | 95.6 | 13.0 | 58.0 | 31.6 | 56.5 | 1,089 | 1,330 | .. | .. |
| Austria | 11,476 | 29,935 | 7.1 | 15.8 | 11.5 | 5.0 | 110.3 | 29.8 | 97 | 97 | .. | .. |
| Azerbaijan | .. | 4 | .. | 0.1 | .. | .. | .. | .. | .. | 2 | .. | .. |
| Bangladesh | 321 | 1,145 | 1.1 | 2.5 | 0.0 | 1.6 | 1.5 | 3.0 | 134 | 230 | 28.5 ^a | -20.7 ^a |
| Belarus | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Belgium | 65,449 | 182,481 | 33.2 | 80.5 | 3.3 | 16.8 | .. | 20.7 | 182 | 174 | .. | .. |
| Benin | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Bolivia | .. | 116 | .. | 1.4 | .. | 0.0 | .. | 1.0 | .. | 18 | .. | .. |
| Bosnia and Herzegovina | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Botswana | 261 | 1,269 | 6.7 | 18.5 | 0.2 | 0.9 | 6.1 | 0.5 | 9 | 16 | -6.9 ^a | 43.9 ^a |
| Brazil | 16,354 | 186,238 | 3.5 | 38.0 | 1.2 | 17.0 | 23.6 | 3.1 | 581 | 428 | -10.3 | -22.5 |
| Bulgaria | .. | 505 | .. | 5.1 | .. | 0.5 | .. | 1.0 | .. | 399 | -30.0 ^a | -7.5 ^a |
| Burkina Faso | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Burundi | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cambodia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cameroon | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Canada | 241,920 | 841,385 | 42.2 | 122.3 | 12.4 | 92.3 | 26.7 | 77.3 | 1,144 | 3,977 | .. | .. |
| Central African Republic | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chad | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chile | 13,645 | 56,310 | 45.0 | 85.6 | 2.6 | 8.6 | 6.3 | 0.5 | 215 | 249 | -15.2 | -8.3 |
| China | 2,028 | 523,952 | 0.5 | 53.8 | 0.2 | 66.8 | 158.9 | 4.7 | 14 | 1,160 | -9.8 | -19.5 |
| Hong Kong, China | 83,397 | 623,398 | 111.5 | 383.3 | 46.3 | 232.3 | 43.1 | 61.3 | 284 | 779 | .. | .. |
| Colombia | 1,416 | 13,217 | 3.5 | 11.8 | 0.2 | 0.5 | 5.6 | 0.3 | 80 | 123 | -43.8 | 25.2 |
| Congo, Dem. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Congo, Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Costa Rica | 475 | 2,303 | 5.5 | 14.7 | 0.1 | 1.4 | 5.8 | 12.0 | 82 | 22 | .. | .. |
| Côte d'Ivoire | 549 | 1,165 | 5.1 | 12.6 | 0.2 | 0.4 | 3.4 | 0.1 | 23 | 38 | -25.6 ^a | -2.4 ^a |
| Croatia | .. | 3,319 | .. | 14.4 | .. | 1.0 | .. | 0.3 | 2 | 62 | 10.9 ^a | -3.5 ^a |
| Cuba | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | .. | 9,331 | .. | 21.7 | .. | 13.0 | .. | 3.7 | .. | 94 | -0.6 | -13.7 |
| Denmark | 39,063 | 107,666 | 29.3 | 66.3 | 8.3 | 56.4 | 28.0 | 86.0 | 258 | 225 | .. | .. |
| Dominican Republic | .. | 141 | .. | 0.8 | .. | .. | .. | .. | .. | 6 | .. | .. |
| Ecuador | 69 | 1,417 | 0.5 | 5.2 | .. | 0.1 | 0.0 | 0.3 | 65 | 31 | 33.0 ^a | 85.4 ^a |
| Egypt, Arab Rep. | 1,765 | 24,335 | 4.1 | 29.1 | 0.3 | 11.3 | .. | 0.7 | 573 | 1,110 | -45.6 | -45.5 |
| El Salvador | .. | 2,672 | .. | 17.2 | .. | 0.4 | .. | 3.0 | .. | 39 | .. | .. |
| Eritrea | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Estonia | .. | 1,483 | .. | 37.1 | .. | 6.6 | .. | 0.9 | .. | 17 | 4.5 ^a | -3.7 ^a |
| Ethiopia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Finland | 22,721 | 293,635 | 16.6 | 241.7 | 2.9 | 170.1 | .. | 64.3 | 73 | 154 | .. | .. |
| France | 314,384 | 1,446,634 | 25.9 | 111.8 | 9.6 | 83.7 | .. | 74.1 | 578 | 808 | .. | .. |
| Gabon | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Gambia, The | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Georgia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Germany | 355,073 | 1,270,243 | 21.0 | 67.8 | 29.7 | 57.1 | 139.3 | 79.1 | 413 | 1,022 | .. | .. |
| Ghana | 76 | 528 | 1.2 | 9.7 | .. | 0.2 | 0.0 | 0.1 | 13 | 22 | -50.9 ^a | 4.5 ^a |
| Greece | 15,228 | 86,538 | 18.1 | 98.4 | 4.7 | 84.4 | 36.3 | 3.1 | 145 | 338 | -44.6 | -31.2 |
| Guatemala | .. | 215 | .. | 1.2 | .. | 0.0 | .. | 2.9 | .. | 5 | .. | .. |
| Guinea | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Guinea-Bissau | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Haiti | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Honduras | 40 | .. | 1.3 | 8.7 | 0.0 | .. | 0.0 | .. | 26 | 71 | .. | .. |



| | Market capitalization | | | | Value traded | | Turnover ratio | | Listed domestic companies | | S&P/IFC Investable Index | |
|--------------------|-----------------------|-----------|----------|-------|--------------|-------|-----------------------------------------------|-------|---------------------------|-------|--------------------------|--------------------|
| | \$ millions | | % of GDP | | % of GDP | | value of shares traded as % of capitalization | | | | % change in price index | |
| | 1990 | 2001 | 1990 | 2000 | 1990 | 2000 | 1990 | 2001 | 1990 | 2001 | 2000 | 2001 |
| Hungary | 505 | 10,367 | 1.5 | 26.3 | 0.3 | 26.6 | 6.3 | 3.8 | 21 | 57 | -28.2 | -10.3 |
| India | 38,567 | 110,396 | 12.2 | 32.4 | 6.9 | 48.4 | 65.9 | 15.8 | 2,435 | 5,795 | -31.1 | -19.9 |
| Indonesia | 8,081 | 23,006 | 7.1 | 17.5 | 3.5 | 9.3 | 75.8 | 2.8 | 125 | 316 | -61.0 | -18.5 |
| Iran, Islamic Rep. | 34,282 | 21,830 | .. | 21.9 | .. | 2.3 | 30.4 | 12.4 | 97 | 295 | .. | .. |
| Iraq | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ireland | .. | 81,882 | .. | 87.2 | .. | 15.4 | .. | 19.2 | .. | 76 | .. | .. |
| Israel | 3,324 | 55,964 | 6.3 | 58.1 | 10.5 | 21.2 | 95.8 | 2.7 | 216 | 636 | 14.7 | -16.4 |
| Italy | 148,766 | 768,364 | 13.5 | 71.5 | 3.9 | 72.5 | 26.8 | 104.0 | 220 | 291 | .. | .. |
| Jamaica | 911 | 4,703 | 21.5 | 48.4 | 0.8 | 1.0 | 3.4 | 0.1 | 44 | 42 | 45.6 ^a | 4.3 ^a |
| Japan | 2,917,679 | 3,157,222 | 95.6 | 65.2 | 52.5 | 55.6 | 43.8 | 69.9 | 2,071 | 2,561 | -27.2 ^b | -33.4 ^b |
| Jordan | 2,001 | 6,316 | 49.8 | 59.3 | 10.1 | 5.0 | 20.0 | 1.3 | 105 | 161 | -24.5 | 31.4 |
| Kazakhstan | .. | 2,260 | .. | 13.4 | .. | 0.1 | .. | 1.2 | .. | 17 | .. | .. |
| Kenya | 453 | 1,050 | 5.3 | 12.4 | 0.1 | 0.5 | 2.2 | 0.2 | 54 | 57 | -8.1 ^a | -22.7 ^a |
| Korea, Dem. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Korea, Rep. | 110,594 | 220,046 | 43.8 | 32.5 | 30.1 | 121.3 | 61.3 | 33.3 | 669 | 1,409 | -57.1 | 51.2 |
| Kuwait | .. | 20,772 | .. | 55.0 | .. | 11.1 | .. | 21.3 | .. | 77 | .. | .. |
| Kyrgyz Republic | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Lao PDR | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Latvia | .. | 697 | .. | 7.9 | .. | 3.2 | .. | 0.2 | .. | 63 | 41.2 ^a | 60.1 ^a |
| Lebanon | .. | 1,243 | .. | 9.6 | .. | 0.7 | .. | 0.5 | .. | 12 | -18.6 ^a | -29.2 ^a |
| Lesotho | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Liberia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Libya | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | .. | 1,199 | .. | 14.0 | .. | 1.8 | .. | 2.0 | .. | 54 | 4.9 ^a | -23.6 ^a |
| Macedonia, FYR | .. | 8 | .. | 0.2 | .. | 0.7 | .. | 348.3 | .. | 2 | .. | .. |
| Madagascar | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Malawi | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Malaysia | 48,611 | 120,007 | 110.4 | 130.4 | 24.7 | 65.2 | 24.6 | 2.1 | 282 | 809 | -23.3 | 4.2 |
| Mali | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Mauritania | .. | 1,091 | .. | .. | .. | .. | .. | 0.4 | .. | 40 | .. | .. |
| Mauritius | 268 | 1,063 | 10.1 | 30.4 | 0.2 | 1.7 | 1.9 | 0.3 | 13 | 40 | -19.4 ^a | -21.8 ^a |
| Mexico | 32,725 | 121,403 | 12.5 | 21.8 | 4.6 | 7.9 | 44.0 | 1.7 | 199 | 168 | -21.5 | 12.8 |
| Moldova | .. | 38 | .. | 3.2 | .. | 0.3 | .. | 97.9 | .. | 58 | .. | .. |
| Mongolia | .. | 32 | .. | 3.5 | .. | 3.9 | .. | 7.3 | .. | 418 | .. | .. |
| Morocco | 966 | 9,087 | 3.7 | 32.7 | 0.2 | 3.3 | .. | 1.2 | 71 | 55 | -19.1 | -17.3 |
| Mozambique | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Myanmar | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Namibia | 21 | 151 | 0.7 | 8.9 | .. | 0.6 | 0.0 | 0.0 | 3 | 13 | -37.8 ^a | -31.0 ^a |
| Nepal | .. | 418 | .. | 8.3 | .. | 0.5 | .. | 6.9 | .. | 108 | .. | .. |
| Netherlands | 119,825 | 640,456 | 40.6 | 175.6 | 13.6 | 185.7 | 29.0 | 101.4 | 260 | 234 | .. | .. |
| New Zealand | 8,835 | 18,613 | 20.5 | 37.3 | 4.5 | 21.6 | 17.3 | 45.9 | 171 | 144 | .. | .. |
| Nicaragua | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Niger | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Nigeria | 1,372 | 5,404 | 4.8 | 10.3 | 0.0 | 0.6 | 0.9 | 0.6 | 131 | 194 | -10.3 ^a | 25.1 ^a |
| Norway | 26,130 | 65,034 | 22.6 | 40.2 | 12.1 | 37.2 | 54.4 | 93.4 | 112 | 191 | .. | .. |
| Oman | 1,061 | 2,606 | 9.4 | 29.4 | 0.9 | 13.0 | 12.3 | 2.0 | 55 | 91 | 7.2 ^a | -27.0 ^a |
| Pakistan | 2,850 | 4,944 | 7.1 | 10.7 | 0.6 | 53.5 | 8.7 | 8.0 | 487 | 747 | -16.7 | -32.8 |
| Panama | 226 | 3,584 | 3.4 | 37.5 | 0.0 | 0.5 | 0.9 | 1.5 | 13 | 31 | .. | .. |
| Papua New Guinea | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Paraguay | .. | 423 | .. | 5.5 | .. | 0.2 | .. | 3.5 | .. | 55 | .. | .. |
| Peru | 812 | 11,134 | 3.1 | 19.8 | 0.4 | 2.8 | 19.3 | 0.5 | 294 | 207 | -28.1 | 14.2 |
| Philippines | 5,927 | 41,523 | 13.4 | 69.0 | 2.7 | 11.0 | 13.6 | 0.5 | 153 | 232 | -43.6 | -29.9 |
| Poland | 144 | 26,017 | 0.2 | 19.8 | 0.0 | 9.3 | 89.7 | 1.9 | 9 | 230 | -3.5 | -24.9 |
| Portugal | 9,201 | 60,681 | 13.0 | 57.8 | 2.4 | 51.8 | 16.9 | 85.5 | 181 | 109 | 38.4 | .. |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | .. | 2,124 | .. | 2.9 | .. | 0.6 | .. | 0.8 | .. | 5,140 | -25.3 ^a | -25.3 ^a |
| Russian Federation | 244 | 76,198 | 0.0 | 15.5 | .. | 8.1 | .. | 3.1 | 13 | 236 | -32.2 | 52.4 |



5.3 | Stock markets

| | Market capitalization | | | | Value traded | | Turnover ratio | | Listed domestic companies | | S&P/IFC Investable Index | |
|--------------------------------|-----------------------|---------------------|---------------|----------------|---------------|----------------|-----------------------------------------------|----------------|---------------------------|-----------------|--------------------------|--------------------|
| | \$ millions | | % of GDP | | % of GDP | | value of shares traded as % of capitalization | | | | % change in price index | |
| | 1990 | 2001 | 1990 | 2000 | 1990 | 2000 | 1990 | 2001 | 1990 | 2001 | 2000 | 2001 |
| Rwanda | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Saudi Arabia | 48,213 | 73,199 | 40.8 | 38.8 | 1.9 | 10.0 | .. | 1.7 | 59 | 76 | 42.3 ^a | 3.7 ^a |
| Senegal | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Sierra Leone | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Singapore | 34,308 | 152,827 | 93.6 | 165.7 | 55.3 | 99.2 | .. | 52.1 | 150 | 418 | .. | .. |
| Slovak Republic | .. | 665 | .. | 3.9 | .. | 4.7 | .. | 17.7 | .. | 844 | 0.4 | 21.3 |
| Slovenia | .. | 2,839 | .. | 14.1 | .. | 2.6 | .. | 3.4 | 24 | 38 | -9.5 ^a | 2.0 ^a |
| Somalia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 137,540 | 139,750 | 122.8 | 162.8 | 7.3 | 61.6 | .. | 3.6 | 732 | 542 | -17.3 | -22.1 |
| Spain | 111,404 | 504,219 | 21.7 | 90.3 | 8.0 | 176.5 | .. | 210.7 | 427 | 1,019 | .. | .. |
| Sri Lanka | 917 | 1,332 | 11.4 | 6.6 | 0.5 | 0.9 | 5.8 | 3.8 | 175 | 238 | -41.7 | 36.5 |
| Sudan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Swaziland | 17 | 95 | 2.0 | 7.0 | .. | 0.0 | .. | 0.2 | 1 | 7 | .. | .. |
| Sweden | 97,929 | 328,339 | 41.1 | 144.4 | 7.4 | 171.6 | 14.9 | 111.2 | 258 | 292 | .. | .. |
| Switzerland | 160,044 | 792,316 | 70.1 | 330.5 | 29.6 | 254.1 | .. | 82.0 | 182 | 252 | .. | .. |
| Syrian Arab Republic | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tajikistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tanzania | .. | 181 | .. | 2.1 | .. | 0.1 | .. | 3.4 | .. | 4 | .. | .. |
| Thailand | 23,896 | 36,340 | 28.0 | 24.1 | 26.8 | 19.0 | 92.6 | 11.5 | 214 | 449 | -54.1 | 3.0 |
| Togo | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Trinidad and Tobago | 696 | 5,035 | 13.7 | 59.2 | 1.1 | 1.9 | 10.0 | 0.7 | 30 | 31 | 8.5 ^a | 1.6 ^a |
| Tunisia | 533 | 2,303 | 4.3 | 14.5 | 0.2 | 3.2 | 3.3 | 1.8 | 13 | 46 | 9.0 ^a | -29.0 ^a |
| Turkey | 19,065 | 47,150 | 12.6 | 34.8 | 3.9 | 89.6 | 42.5 | 15.3 | 110 | 310 | -51.2 | -30.2 |
| Turkmenistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Uganda | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ukraine | .. | 1,365 | .. | 5.9 | .. | 0.9 | .. | 1.6 | .. | 131 | 75.2 ^a | -36.3 ^a |
| United Arab Emirates | .. | 23,262 | .. | 71.6 | .. | .. | .. | .. | .. | 54 | .. | .. |
| United Kingdom | 848,866 | 2,576,992 | 85.9 | 182.2 | 28.2 | 129.7 | 33.4 | 66.6 | 1,701 | 1,904 | -10.2 ^c | -18.3 ^c |
| United States | 3,059,434 | 15,104,037 | 53.2 | 153.5 | 30.5 | 323.9 | 53.4 | 200.8 | 6,599 | 7,524 | -10.1 ^d | -13.0 ^d |
| Uruguay | .. | 168 | .. | 0.8 | .. | 0.0 | .. | 0.9 | 36 | 17 | .. | .. |
| Uzbekistan | .. | 119 | .. | 1.4 | .. | 0.4 | .. | .. | .. | 4 | .. | .. |
| Venezuela, RB | 8,361 | 6,216 | 17.2 | 6.7 | 4.6 | 0.6 | 43.0 | 0.5 | 76 | 63 | 18.7 | -20.1 |
| Vietnam | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| West Bank and Gaza | .. | 848 | .. | 19.8 | .. | 3.5 | .. | 20.9 | .. | 22 | .. | .. |
| Yemen, Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yugoslavia, Fed. Rep. | .. | 10,817 | .. | 109.9 | .. | 0.1 | .. | 0.0 | .. | 16 | .. | .. |
| Zambia | .. | 291 | .. | 9.4 | .. | 0.5 | .. | 4.7 | .. | 8 | .. | .. |
| Zimbabwe | 2,395 | 7,972 | 27.3 | 32.9 | 0.6 | 3.8 | 2.9 | 1.6 | 57 | 72 | -24.6 | 134.3 |
| World | 9,399,659 s | 32,189,220 s | 48.0 w | 105.1 w | 28.5 w | 153.8 w | 57.2 w | 122.3 w | 25,424 s | 48,645 s | | |
| Low income | 54,588 | 194,186 | 9.8 | 23.6 | 4.7 | 32.8 | 53.8 | 121.3 | 3,446 | 7,733 | | |
| Middle income | 430,288 | 2,049,260 | 21.2 | 41.2 | 8.0 | 37.7 | 78.3 | 84.9 | 4,900 | 15,364 | | |
| Lower middle income | 39,161 | 777,998 | 5.3 | 40.3 | .. | 40.9 | .. | 101.0 | 1,723 | 10,142 | | |
| Upper middle income | 391,127 | 1,271,262 | 25.8 | 41.8 | 8.1 | 35.7 | 37.1 | 74.7 | 3,177 | 5,222 | | |
| Low & middle income | 484,876 | 2,243,446 | 19.9 | 38.7 | 7.6 | 37.0 | 70.7 | 90.1 | 8,346 | 23,097 | | |
| East Asia & Pacific | 197,109 | 954,452 | 21.3 | 48.3 | 13.2 | 69.8 | 117.2 | 148.9 | 1,443 | 3,486 | | |
| Europe & Central Asia | 19,065 | 173,932 | 2.1 | 20.5 | .. | 27.8 | .. | 83.1 | 110 | 8,220 | | |
| Latin America & Carib. | 78,188 | 614,691 | 7.6 | 34.0 | 2.1 | 8.9 | 29.7 | 26.9 | 1,734 | 1,567 | | |
| Middle East & N. Africa | 5,265 | 126,253 | 27.8 | 34.8 | 1.5 | 7.2 | .. | 22.3 | 817 | 1,596 | | |
| South Asia | 42,655 | 156,905 | 10.8 | 27.0 | 5.6 | 43.8 | 54.0 | 161.6 | 3,231 | 7,159 | | |
| Sub-Saharan Africa | 142,594 | 217,212 | 51.9 | 102.3 | .. | 36.8 | .. | 22.5 | 1,011 | 1,069 | | |
| High income | 8,914,783 | 29,945,774 | 51.7 | 120.6 | 31.4 | 181.1 | 59.5 | 129.9 | 17,078 | 25,548 | | |
| Europe EMU | 1,183,983 | 5,423,384 | 21.6 | 89.9 | 14.2 | 83.1 | .. | 90.6 | 2,630 | 4,367 | | |

Note: Because aggregates for market capitalization are unavailable for 2001, those shown refer to 2000.

a. Data refer to the S&P/IFC Global index. b. Data refer to the Nikkei 225 index. c. Data refer to the FT 100 index. d. Data refer to the S&P 500 index.



About the data

Financial market development is closely related to an economy's overall development. Well-functioning financial systems provide good and easily accessible information, which lowers transactions costs, which in turn improves resource allocation and economic growth. Both banking systems and stock markets enhance growth, which is the main factor in poverty reduction. At low levels of economic development commercial banks tend to dominate the financial system. In higher-income economies domestic stock markets tend to become more active and efficient relative to domestic banks. The structure and development of a country's financial system are also determined by aspects of the legal, regulatory, tax, and macroeconomic environment.

The stock market indicators presented in the table include measures of size (market capitalization and number of listed domestic companies) and liquidity (value traded as a percentage of GDP, and turnover ratio). The comparability of such indicators between countries may be limited by conceptual and statistical weaknesses, such as inaccurate reporting and differences in accounting standards. The percentage change in stock market prices in U.S. dollars, from the Standard & Poor's Investable (S&P/IFCI) and Global (S&P/IFCG) country indexes, is an important measure of overall performance. Regulatory and institutional factors that can affect investor confidence, such as the existence of a securities and exchange commission and the quality of investor protection laws, may influence the functioning of stock markets but are not included in this table.

Stock market size can be measured in a number of ways, each of which may produce a different ranking among countries. Market capitalization shows the overall size of the stock market in U.S. dollars and as a percentage of GDP. The number of listed domestic companies is another measure of market size. Market size is positively correlated with the ability to mobilize capital and diversify risk.

Market liquidity, the ability to easily buy and sell securities, is measured by dividing the total value traded by GDP. This indicator complements the market capitalization ratio by showing whether market size is matched by trading. The turnover ratio—the value of shares traded as a percentage of market capitalization—is also a measure of liquidity, as well as of transactions costs. (High turnover indicates low transactions costs.) The turnover ratio complements the ratio of value traded to GDP, because the turnover ratio is related to the size of the market and the value traded ratio to the size of the economy. A small, liquid market will have a high turnover ratio but a low value traded ratio. Liquidity is an important attribute of stock markets because, in theory, liquid markets improve the allocation of capital and enhance prospects

for long-term economic growth. A more comprehensive measure of liquidity would include trading costs and the time and uncertainty in finding a counterpart in settling trades.

Standard & Poor's maintains a series of indexes for investors interested in investing in stock markets in developing countries. At the core of the Standard & Poor's family of emerging market indexes, the S&P/IFCI indexes are intended to represent the most active stocks in the markets they cover and to be the broadest possible indicator of market movements. The S&P/IFCI indexes, which apply the same calculation methodology as the S&P/IFCG indexes, are designed to measure the returns foreign portfolio investors might receive from investing in emerging market stocks that are legally and practically open to foreign portfolio investment. The EMDB covers 54 markets, providing regular updates on more than 2,200 stocks; the S&P/IFCG indexes include 34 markets and more than 1,900 stocks; the S&P/IFCI indexes cover 30 markets and close to 1,200 stocks. They are widely used benchmarks for international portfolio management. See Standard & Poor's (2001b) for further information on the indexes.

Because markets included in Standard & Poor's emerging markets category vary widely in level of development, it is best to look at the entire category to identify the most significant market trends. And it is useful to remember that stock market trends may be distorted by currency conversions, especially when a currency has registered a significant devaluation.

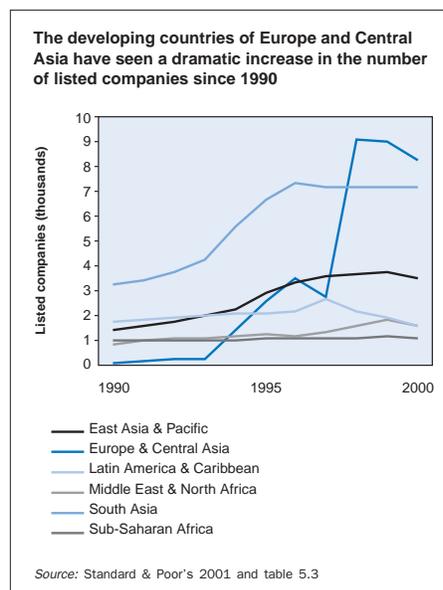
Definitions

- **Market capitalization** (also known as market value) is the share price times the number of shares outstanding.
- **Value traded** refers to the total value of shares traded during the period.
- **Turnover ratio** is the total value of shares traded during the period divided by the average market capitalization for the period. Average market capitalization is calculated as the average of the end-of-period values for the current period and the previous period.
- **Listed domestic companies** are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. This indicator does not include investment companies, mutual funds, or other collective investment vehicles.
- **S&P/IFC Investable index** price change is the U.S. dollar price change in the stock markets covered by the S&P/IFCI country index, supplemented by the S&P/IFCG country index.

Data sources

The data on stock markets are from Standard & Poor's *Emerging Stock Markets Factbook 2001*, supplemented by other data from Standard & Poor's. The firm collects data through an annual survey of the world's stock exchanges, supplemented by information provided by its network of correspondents and by Reuters. The GDP data are from the World Bank's national accounts data files. *About the data* is based on Demirgüç-Kunt and Levine (1996a) and Beck and Levine (2001).

Figure 5.3





5.4 | Financial depth and efficiency

| | Domestic credit provided by banking sector | | Liquid liabilities | | Quasi-liquid liabilities | | Ratio of bank liquid reserves to bank assets | | Interest rate spread | | Spread over LIBOR | |
|--------------------------|--------------------------------------------|-------|--------------------|-------|--------------------------|-------|----------------------------------------------|------|----------------------------------------------|------|--------------------------------------------|-------|
| | % of GDP | | % of GDP | | % of GDP | | % | | Lending minus deposit rate percentage points | | Lending rate minus LIBOR percentage points | |
| | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 |
| Afghanistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Albania | .. | 48.3 | .. | 60.8 | .. | 37.8 | .. | 12.0 | 2.1 | 13.8 | 16.7 | 15.6 |
| Algeria | 74.5 | 32.0 | 73.5 | 41.4 | 24.8 | 15.4 | 1.3 | 3.0 | .. | 2.5 | .. | 3.5 |
| Angola | .. | -15.3 | .. | 18.2 | .. | 12.2 | .. | 17.7 | .. | 63.6 | .. | 96.6 |
| Argentina | 32.4 | 34.4 | 11.5 | 31.9 | 7.1 | 24.9 | 7.4 | 2.5 | .. | 2.7 | .. | 4.6 |
| Armenia | 58.7 | 11.5 | 79.9 | 14.7 | 42.9 | 7.8 | 13.6 | 7.0 | .. | 13.5 | .. | 25.0 |
| Australia | 71.7 | 91.7 | 55.1 | 66.5 | 43.4 | 46.0 | 1.5 | 0.6 | 4.5 | 4.7 | 9.9 | 2.3 |
| Austria | 121.4 | .. | .. | .. | .. | .. | .. | 2.1 | .. | 3.4 | .. | 0.2 |
| Azerbaijan | 57.2 | 9.6 | 33.5 | 16.3 | 11.6 | 9.6 | 4.5 | 9.3 | .. | .. | .. | .. |
| Bangladesh | 23.9 | 35.3 | 23.4 | 34.7 | 16.8 | 25.5 | 12.8 | 7.6 | 4.0 | 6.9 | 7.7 | 9.0 |
| Belarus | .. | 19.2 | .. | 17.7 | .. | 12.1 | .. | 7.7 | .. | 30.1 | .. | 61.1 |
| Belgium | 8.6 | 7.3 | 7.0 | 5.3 | 5.7 | 3.7 | 1.1 | 0.8 | -0.9 | 1.3 | -0.9 | -2.2 |
| Benin | 22.4 | 8.8 | 26.7 | 31.1 | 5.9 | 7.4 | 29.3 | 10.0 | 9.0 | .. | 7.7 | .. |
| Bolivia | 30.7 | 64.7 | 24.5 | 54.6 | 18.0 | 46.8 | 18.8 | 5.8 | 18.0 | 23.6 | 33.5 | 28.1 |
| Bosnia and Herzegovina | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Botswana | -46.4 | -71.9 | 22.1 | 27.2 | 13.7 | 20.1 | 11.0 | 3.6 | 1.8 | 5.2 | -0.4 | 8.8 |
| Brazil | 89.8 | 50.9 | 26.4 | 29.2 | 18.5 | 22.4 | 6.7 | 7.6 | .. | 39.6 | .. | 50.3 |
| Bulgaria | 118.5 | 18.3 | 71.9 | 35.0 | 53.6 | 20.7 | 10.2 | 6.6 | 8.9 | 8.4 | 42.4 | 5.0 |
| Burkina Faso | 13.7 | 16.9 | 21.3 | 24.9 | 7.5 | 7.5 | 12.7 | 4.6 | 9.0 | .. | 7.7 | .. |
| Burundi | 23.2 | 30.1 | 18.2 | 19.9 | 6.5 | 6.1 | 2.8 | 3.0 | .. | .. | 4.0 | 9.2 |
| Cambodia | .. | 7.4 | .. | 15.0 | .. | 10.6 | .. | 47.3 | .. | 10.5 | .. | 10.8 |
| Cameroon | 31.2 | 16.3 | 22.6 | 17.3 | 10.1 | 6.4 | 3.4 | 15.4 | 11.0 | 17.0 | 10.2 | 15.5 |
| Canada | 82.5 | 89.2 | 74.5 | 75.0 | 59.9 | 52.8 | 1.6 | 0.7 | 1.3 | 1.6 | 5.7 | 0.7 |
| Central African Republic | 12.9 | 11.4 | 15.3 | 16.2 | 1.8 | 1.3 | 2.8 | 1.7 | 11.0 | 17.0 | 10.2 | 15.5 |
| Chad | 11.5 | 12.2 | 14.6 | 12.2 | 0.6 | 0.8 | 3.3 | 12.9 | 11.0 | 17.0 | 10.2 | 15.5 |
| Chile | 73.0 | 74.7 | 40.7 | 50.3 | 32.8 | 40.0 | 3.8 | 3.1 | 8.5 | 5.6 | 40.6 | 8.3 |
| China | 90.0 | 132.7 | 79.2 | 152.1 | 41.4 | 91.1 | 15.7 | 12.7 | 0.7 | 3.6 | 1.0 | -0.7 |
| Hong Kong, China | 156.3 | 141.4 | 181.7 | 236.8 | 166.8 | 222.3 | 0.1 | 0.3 | 3.3 | 4.7 | 1.7 | 3.0 |
| Colombia | 35.9 | 36.5 | 29.8 | 32.8 | 19.3 | 22.8 | 26.3 | 5.9 | 8.8 | 6.6 | 36.9 | 12.3 |
| Congo, Dem. Rep. | 25.3 | .. | 12.9 | .. | 2.1 | .. | 48.5 | .. | .. | .. | .. | 158.5 |
| Congo, Rep. | 29.1 | 8.7 | 22.0 | 14.6 | 6.1 | 1.1 | 2.0 | 43.1 | 11.0 | 17.0 | 10.2 | 15.5 |
| Costa Rica | 29.9 | 32.7 | 42.7 | 36.9 | 30.0 | 23.9 | 68.5 | 18.9 | 11.4 | 11.5 | 24.2 | 18.4 |
| Côte d'Ivoire | 44.5 | 25.6 | 28.8 | 24.6 | 10.9 | 7.3 | 2.1 | 3.9 | 9.0 | .. | 7.7 | .. |
| Croatia | .. | 45.7 | .. | 46.1 | .. | 34.6 | .. | 10.7 | 499.3 | 8.3 | 1,153.9 | 5.5 |
| Cuba | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | .. | 57.3 | .. | 73.8 | .. | 48.3 | .. | 18.4 | .. | 3.7 | .. | 0.6 |
| Denmark | 63.0 | 56.7 | 59.0 | 55.3 | 29.4 | 24.3 | 1.1 | 8.1 | 6.2 | 4.9 | 5.8 | 1.5 |
| Dominican Republic | 31.5 | 38.5 | 28.4 | 34.7 | 13.1 | 23.7 | 31.1 | 27.5 | 15.2 | 9.1 | 29.3 | 20.3 |
| Ecuador | 15.0 | 39.9 | 20.4 | 31.3 | 11.3 | 21.3 | 22.6 | 3.8 | -6.0 | 8.9 | 29.2 | 9.7 |
| Egypt, Arab Rep. | 106.8 | 100.2 | 87.9 | 83.9 | 60.7 | 65.4 | 17.1 | 15.9 | 7.0 | 3.8 | 10.7 | 6.7 |
| El Salvador | 32.0 | 42.3 | 30.6 | 46.2 | 19.6 | 37.9 | 33.4 | 29.8 | 3.2 | 4.6 | 12.9 | 7.4 |
| Eritrea | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Estonia | 66.7 | 40.0 | 136.0 | 39.3 | 95.2 | 14.6 | 43.1 | 19.9 | .. | 3.9 | 26.6 | 1.1 |
| Ethiopia | 67.0 | 61.7 | 42.2 | 42.5 | 12.6 | 20.6 | 24.0 | 13.6 | 3.6 | 4.2 | -2.3 | 4.4 |
| Finland | 83.1 | 55.8 | 54.4 | 48.1 | .. | .. | 4.1 | 2.5 | 4.1 | 4.0 | 3.3 | -0.9 |
| France | 104.4 | .. | .. | .. | .. | .. | 1.0 | .. | 6.1 | 4.1 | 2.3 | 0.2 |
| Gabon | 20.0 | 12.9 | 17.8 | 15.0 | 6.6 | 5.9 | 2.0 | 12.8 | 11.0 | 17.0 | 10.2 | 15.5 |
| Gambia, The | 3.4 | 13.8 | 20.7 | 36.8 | 8.8 | 18.5 | 8.8 | 10.1 | 15.2 | 11.5 | 18.2 | 17.5 |
| Georgia | .. | 21.9 | .. | 10.5 | .. | 4.3 | .. | 13.7 | .. | 22.6 | .. | 26.2 |
| Germany | 103.4 | 147.5 | 68.9 | 78.1 | .. | .. | 3.2 | 1.4 | 4.5 | 6.2 | 3.3 | 3.1 |
| Ghana | 13.2 | 40.8 | 14.1 | 20.1 | 3.4 | 10.5 | 20.2 | 4.8 | .. | .. | .. | .. |
| Greece | 99.3 | 101.8 | .. | .. | .. | .. | 13.8 | 25.2 | 8.1 | 6.2 | 19.3 | 5.8 |
| Guatemala | 17.4 | 16.9 | 21.2 | 28.6 | 11.8 | 15.8 | 31.8 | 15.6 | 5.1 | 10.7 | 15.0 | 14.4 |
| Guinea | 6.0 | 8.9 | 0.8 | 11.6 | 0.8 | 2.1 | 6.2 | 17.8 | 0.2 | 11.9 | 12.9 | 12.8 |
| Guinea-Bissau | 77.5 | 18.1 | 68.9 | 42.7 | 4.4 | 0.7 | 10.8 | 45.5 | 13.1 | .. | 37.4 | .. |
| Haiti | 32.9 | 31.5 | 31.4 | 37.0 | 15.9 | 25.4 | 74.9 | 37.3 | .. | 13.2 | .. | 18.6 |
| Honduras | 40.9 | 31.5 | 33.6 | 52.1 | 18.8 | 38.5 | 6.6 | 18.0 | 8.3 | 10.9 | 8.7 | 20.3 |



| | Domestic credit provided by banking sector | | Liquid liabilities | | Quasi-liquid liabilities | | Ratio of bank liquid reserves to bank assets | | Interest rate spread | | Spread over LIBOR | |
|--------------------|--------------------------------------------|-------|--------------------|-------|--------------------------|-------|----------------------------------------------|------|----------------------------------------------|------|--------------------------------------------|------|
| | % of GDP | | % of GDP | | % of GDP | | % | | Lending minus deposit rate percentage points | | Lending rate minus LIBOR percentage points | |
| | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 |
| Hungary | 105.5 | 53.9 | 43.8 | 46.3 | 19.0 | 27.8 | 11.0 | 10.8 | 4.1 | 3.0 | 20.5 | 6.1 |
| India | 51.5 | 53.4 | 43.1 | 56.1 | 28.1 | 39.3 | 14.8 | 8.0 | .. | .. | 8.2 | 5.8 |
| Indonesia | 45.5 | 66.2 | 40.4 | 57.5 | 29.1 | 45.3 | 4.5 | 8.1 | 3.3 | 6.0 | 12.5 | 11.9 |
| Iran, Islamic Rep. | 70.8 | 49.3 | 57.6 | 42.9 | 31.1 | 23.8 | 66.0 | 41.0 | .. | .. | .. | .. |
| Iraq | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ireland | 55.2 | 110.2 | 44.5 | .. | .. | .. | 4.8 | 1.4 | 5.0 | 4.7 | 3.0 | -1.8 |
| Israel | 106.2 | 86.5 | 70.2 | 97.5 | 63.6 | 90.6 | 11.9 | 13.6 | 12.0 | 4.2 | 18.1 | 6.3 |
| Italy | 89.4 | 98.5 | 70.5 | .. | .. | .. | 12.0 | 0.7 | 7.3 | 4.4 | 5.8 | -0.3 |
| Jamaica | 34.8 | 38.0 | 51.0 | 47.3 | 37.8 | 32.3 | 37.4 | 19.0 | 6.6 | 11.7 | 22.2 | 16.8 |
| Japan | 259.7 | 310.5 | 182.4 | 189.9 | 155.3 | 142.4 | 1.5 | 1.4 | 3.4 | 2.0 | -1.4 | -4.5 |
| Jordan | 117.9 | 90.6 | 131.2 | 113.1 | 77.8 | 79.0 | 20.5 | 29.0 | 2.2 | 4.8 | 2.0 | 5.3 |
| Kazakhstan | .. | 14.1 | .. | 15.3 | .. | 6.2 | .. | 5.4 | .. | .. | .. | .. |
| Kenya | 52.9 | 48.2 | 43.3 | 46.1 | 29.3 | 31.0 | 9.9 | 8.3 | 5.1 | 14.2 | 10.4 | 15.8 |
| Korea, Dem. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Korea, Rep. | 65.7 | 104.0 | 54.6 | 97.9 | 45.7 | 88.8 | 6.3 | 2.0 | 0.0 | 0.6 | 1.7 | 2.0 |
| Kuwait | 243.0 | 82.2 | 192.2 | 70.4 | 153.9 | 57.8 | 1.2 | 1.0 | 0.4 | 3.0 | 4.1 | 2.3 |
| Kyrgyz Republic | .. | 12.6 | .. | 11.9 | .. | 4.5 | .. | 18.7 | .. | 33.5 | .. | 45.4 |
| Lao PDR | 5.1 | 10.7 | 7.2 | 16.7 | 3.1 | 14.2 | 3.4 | 28.1 | .. | 20.0 | .. | 25.5 |
| Latvia | .. | 24.2 | .. | 30.4 | .. | 12.8 | .. | 5.8 | .. | 7.5 | .. | 5.3 |
| Lebanon | 132.6 | 183.3 | 193.7 | 198.1 | 170.9 | 188.5 | 3.9 | 12.7 | 23.1 | 6.9 | 31.6 | 11.6 |
| Lesotho | 32.8 | 3.7 | 39.2 | 27.3 | 22.6 | 10.7 | 23.0 | 23.6 | 7.4 | 12.2 | 12.1 | 10.6 |
| Liberia | .. | .. | .. | .. | .. | .. | 64.9 | 70.9 | .. | 14.3 | .. | 14.0 |
| Libya | .. | .. | .. | .. | .. | .. | 26.4 | 30.5 | 1.5 | 4.0 | -1.3 | 0.5 |
| Lithuania | .. | 14.4 | .. | 23.1 | .. | 10.6 | .. | 12.0 | .. | 8.3 | .. | 5.6 |
| Macedonia, FYR | .. | 14.5 | .. | 19.4 | .. | 9.9 | .. | 7.9 | .. | 7.7 | .. | 12.4 |
| Madagascar | 26.2 | 15.2 | 17.8 | 26.8 | 5.3 | 11.5 | 8.5 | 20.1 | 5.3 | 11.5 | 17.5 | 20.0 |
| Malawi | 19.7 | 8.7 | 21.1 | 18.3 | 11.7 | 9.3 | 32.8 | 15.2 | 8.9 | 19.9 | 12.7 | 46.6 |
| Malaysia | 75.7 | 143.4 | 64.4 | 130.0 | 43.0 | 106.4 | 5.9 | 14.0 | 1.3 | 3.4 | -1.1 | 0.2 |
| Mali | 13.7 | 15.0 | 20.5 | 24.9 | 5.5 | 7.1 | 50.8 | 17.7 | 9.0 | .. | 7.7 | .. |
| Mauritania | 54.7 | -2.7 | 28.5 | 14.8 | 7.0 | 3.9 | 6.1 | 4.3 | 5.0 | .. | 1.7 | .. |
| Mauritius | 45.1 | 74.8 | 63.3 | 83.1 | 49.1 | 71.5 | 8.8 | 5.1 | 5.4 | 11.2 | 9.7 | 14.2 |
| Mexico | 36.6 | 25.4 | 22.8 | 23.6 | 16.4 | 15.3 | 4.2 | 5.8 | .. | 12.0 | .. | 11.7 |
| Moldova | 62.8 | 25.3 | 70.3 | 22.4 | 35.4 | 9.7 | 8.3 | 13.3 | .. | 8.9 | .. | 27.2 |
| Mongolia | 73.4 | 10.5 | 56.2 | 24.8 | 14.7 | 12.3 | 2.0 | 18.1 | .. | 16.5 | .. | 23.7 |
| Morocco | 60.1 | 92.1 | 61.0 | 82.6 | 18.4 | 21.5 | 11.3 | 6.3 | 0.5 | 8.2 | 0.7 | 6.8 |
| Mozambique | 15.6 | 11.2 | 26.5 | 30.4 | 5.2 | 15.9 | 61.5 | 8.5 | .. | 9.3 | .. | 12.5 |
| Myanmar | 32.8 | 26.8 | 27.9 | 25.7 | 7.8 | 9.9 | 271.8 | 23.4 | 2.1 | 5.5 | -0.3 | 8.7 |
| Namibia | 18.8 | 48.0 | 22.6 | 45.0 | 13.2 | 21.1 | 4.4 | 3.2 | 10.6 | 7.9 | 17.4 | 8.7 |
| Nepal | 28.9 | 43.2 | 32.2 | 51.5 | 18.5 | 34.9 | 12.7 | 10.6 | 2.5 | 3.5 | 6.1 | 2.9 |
| Netherlands | 103.2 | .. | .. | .. | .. | .. | 0.3 | .. | 8.4 | 1.9 | 3.4 | -1.7 |
| New Zealand | 81.6 | 117.8 | 77.9 | 89.1 | 64.8 | 74.9 | 0.8 | 0.5 | 4.4 | 3.9 | 7.7 | 3.7 |
| Nicaragua | 206.6 | 141.9 | 56.9 | 64.2 | 23.1 | 52.9 | 20.2 | 15.4 | 12.5 | 11.9 | 13.7 | 14.8 |
| Niger | 16.2 | 9.0 | 19.8 | 8.0 | 8.3 | 2.1 | 42.9 | 9.9 | 9.0 | .. | 7.7 | .. |
| Nigeria | 23.7 | 11.3 | 23.6 | 24.8 | 10.3 | 9.2 | 11.6 | 15.4 | 5.5 | 9.6 | 17.0 | 14.7 |
| Norway | 89.5 | 55.8 | 59.9 | 50.9 | 27.0 | 11.2 | 0.5 | 2.2 | 4.6 | 1.5 | 5.9 | 1.7 |
| Oman | 16.6 | 44.7 | 28.9 | 37.0 | 19.3 | 28.3 | 6.9 | 3.6 | 1.4 | 2.4 | 1.4 | 3.5 |
| Pakistan | 50.9 | 49.0 | 39.8 | 47.5 | 10.0 | 20.0 | 8.9 | 6.2 | .. | .. | .. | .. |
| Panama | 52.7 | 110.8 | 41.1 | 86.9 | 33.0 | 75.1 | .. | .. | 3.6 | 3.1 | 3.7 | 3.6 |
| Papua New Guinea | 35.7 | 25.9 | 35.2 | 29.7 | 24.0 | 16.7 | 3.2 | 8.0 | 6.9 | 3.0 | 7.2 | 11.0 |
| Paraguay | 14.9 | 27.2 | 22.3 | 36.7 | 13.7 | 26.9 | 31.0 | 22.7 | 8.1 | 11.1 | 22.7 | 20.3 |
| Peru | 20.2 | 25.9 | 24.8 | 32.1 | 11.8 | 20.8 | 22.0 | 21.6 | 2,335.0 | 14.6 | 4,766.2 | 21.4 |
| Philippines | 26.9 | 68.0 | 37.0 | 66.5 | 28.4 | 54.7 | 20.9 | 7.4 | 4.6 | 2.6 | 15.8 | 4.4 |
| Poland | 19.5 | 37.8 | 34.0 | 43.0 | 17.2 | 30.9 | 20.6 | 4.6 | 462.5 | 5.8 | 495.9 | 13.5 |
| Portugal | 70.0 | 142.8 | .. | .. | .. | .. | 29.0 | 3.6 | 7.8 | 2.8 | 13.5 | -0.2 |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | 79.7 | 14.1 | 60.4 | 23.2 | 32.7 | 17.7 | 1.2 | 36.4 | .. | .. | .. | .. |
| Russian Federation | .. | 24.0 | .. | 22.1 | .. | 9.6 | .. | 15.4 | .. | 17.9 | .. | 17.9 |



5.4 | Financial depth and efficiency

| | Domestic credit provided by banking sector | | Liquid liabilities | | Quasi-liquid liabilities | | Ratio of bank liquid reserves to bank assets | | Interest rate spread | | Spread over LIBOR | |
|--------------------------------|--------------------------------------------|--------------|--------------------|---------------|--------------------------|---------------|----------------------------------------------|--------------|----------------------------------------------|------|--------------------------------------------|------|
| | % of GDP | | % of GDP | | % of GDP | | % | | Lending minus deposit rate percentage points | | Lending rate minus LIBOR percentage points | |
| | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 |
| Rwanda | 17.1 | 12.6 | 14.9 | 16.3 | 7.0 | 7.3 | 4.3 | 9.9 | 6.3 | .. | 4.9 | .. |
| Saudi Arabia | 58.7 | 68.4 | 47.9 | 48.6 | 21.9 | 23.0 | 5.6 | 4.7 | .. | .. | .. | .. |
| Senegal | 33.8 | 25.1 | 22.9 | 25.4 | 9.7 | 10.5 | 14.1 | 6.4 | 9.0 | .. | 7.7 | .. |
| Sierra Leone | 26.3 | 54.4 | 13.1 | 16.4 | 2.6 | 5.8 | 64.1 | 14.7 | 12.0 | 17.0 | 44.2 | 19.7 |
| Singapore | 75.6 | 89.6 | 123.4 | 107.5 | 100.5 | 86.5 | 3.7 | 2.5 | 2.7 | 4.1 | -1.0 | -0.7 |
| Slovak Republic | .. | 59.9 | .. | 67.8 | .. | 46.8 | .. | 5.7 | .. | 6.4 | .. | 8.4 |
| Slovenia | 36.8 | 47.1 | 34.2 | 49.7 | 25.8 | 40.1 | 2.7 | 3.5 | 142.0 | 5.7 | 818.6 | 9.2 |
| Somalia | .. | .. | .. | .. | .. | .. | .. | 22.3 | .. | .. | .. | .. |
| South Africa | 97.8 | 162.6 | 44.6 | 46.3 | 27.2 | 15.9 | 3.3 | 2.7 | 2.1 | 5.3 | 12.7 | 8.0 |
| Spain | 106.2 | 119.8 | .. | .. | .. | .. | 8.7 | 1.0 | 5.4 | 2.2 | 7.7 | -1.4 |
| Sri Lanka | 43.1 | 44.4 | 35.2 | 46.6 | 22.9 | 37.2 | 9.9 | 7.6 | -6.4 | 7.0 | 4.7 | 9.6 |
| Sudan | 20.4 | 8.6 | 20.1 | 11.7 | 2.9 | 3.8 | 79.5 | 36.4 | .. | .. | .. | .. |
| Swaziland | 7.9 | -4.1 | 29.6 | 22.2 | 20.8 | 15.2 | 21.5 | 7.2 | 5.6 | 7.5 | 6.2 | 7.5 |
| Sweden | 140.3 | 79.3 | 52.3 | 44.8 | .. | .. | 1.8 | 0.4 | 6.8 | 3.7 | 8.4 | -0.7 |
| Switzerland | 179.0 | 179.2 | 145.2 | 130.9 | 118.6 | 91.3 | 1.1 | 0.8 | -0.9 | 1.3 | -0.9 | -2.2 |
| Syrian Arab Republic | 56.6 | 27.6 | 54.7 | 66.2 | 10.5 | 22.9 | 46.0 | 5.8 | .. | .. | .. | .. |
| Tajikistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tanzania | 34.6 | 12.1 | 19.9 | 19.7 | 6.3 | 10.1 | 5.3 | 15.0 | .. | 14.2 | .. | 15.0 |
| Thailand | 91.1 | 121.7 | 74.9 | 115.2 | 66.0 | 101.2 | 3.1 | 1.9 | 2.2 | 4.5 | 6.1 | 1.3 |
| Togo | 21.3 | 23.8 | 36.1 | 28.4 | 19.1 | 8.0 | 59.0 | 6.2 | 9.0 | .. | 7.7 | .. |
| Trinidad and Tobago | 58.5 | 47.3 | 54.6 | 57.2 | 42.7 | 45.6 | 13.5 | 14.4 | 6.9 | 8.3 | 4.6 | 10.0 |
| Tunisia | 62.5 | 73.2 | 51.5 | 57.8 | 26.7 | 33.9 | 1.6 | 2.6 | .. | .. | .. | .. |
| Turkey | 19.4 | 53.7 | 24.1 | 44.9 | 16.4 | 39.6 | 16.3 | 7.1 | .. | .. | .. | .. |
| Turkmenistan | .. | 30.5 | .. | 14.9 | .. | 5.1 | .. | 4.1 | .. | .. | .. | .. |
| Uganda | 17.8 | 12.2 | 7.6 | 16.2 | 1.4 | 7.5 | 15.2 | 12.4 | 7.4 | 13.1 | 30.4 | 16.4 |
| Ukraine | 83.2 | 23.4 | 50.1 | 18.1 | 9.0 | 6.1 | 49.0 | 17.9 | .. | 27.8 | .. | 35.0 |
| United Arab Emirates | 34.7 | 59.9 | 46.3 | 57.9 | 37.7 | 41.6 | 4.4 | 11.5 | .. | .. | .. | .. |
| United Kingdom | 121.4 | 136.1 | .. | .. | .. | .. | 0.5 | 0.4 | 2.2 | 2.7 | 6.4 | -0.6 |
| United States | 110.9 | 161.7 | 65.5 | 62.1 | 49.4 | 47.5 | 2.3 | 1.1 | .. | .. | 1.7 | 2.7 |
| Uruguay | 46.7 | 54.3 | 58.1 | 51.3 | 51.5 | 45.4 | 31.1 | 11.1 | 76.6 | 36.9 | 166.1 | 42.5 |
| Uzbekistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Venezuela, RB | 37.4 | 14.3 | 38.8 | 18.9 | 29.4 | 9.1 | 21.9 | 29.5 | 7.7 | 8.9 | 27.2 | 18.7 |
| Vietnam | 4.7 | 35.0 | 22.7 | 44.4 | 9.3 | 23.9 | 13.3 | 9.1 | .. | 6.9 | .. | 4.0 |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | 60.6 | 5.2 | 55.1 | 34.1 | 10.4 | 16.1 | 121.2 | 18.8 | .. | 3.8 | .. | 16.6 |
| Yugoslavia, Fed. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Zambia | 67.8 | 79.1 | 21.8 | 26.8 | 10.6 | 18.3 | 33.7 | 13.1 | 9.5 | 18.6 | 26.8 | 32.3 |
| Zimbabwe | 41.7 | 48.3 | 41.8 | 34.5 | 30.3 | 17.6 | 12.2 | 8.7 | 2.9 | 18.0 | 3.4 | 61.7 |
| World | 120.7 w | 152 w | 82.8 w | 92.0 w | .. w | 68.1 w | 9.9 m | 8.5 m | | | | |
| Low income | 44.6 | 45.9 | 37.1 | 46.8 | 22.2 | 31.2 | 13.5 | 13.2 | | | | |
| Middle income | 65.1 | 72.9 | 44.7 | 69.4 | 28.0 | 47.1 | 12.4 | 7.8 | | | | |
| Lower middle income | .. | 90.3 | .. | 98.6 | .. | 61.1 | 19.7 | 7.9 | | | | |
| Upper middle income | 60.5 | 60.2 | 33.8 | 48.0 | 23.5 | 36.9 | 8.1 | 7.6 | | | | |
| Low & middle income | 61.0 | 68.7 | 43.1 | 65.8 | 26.9 | 44.7 | 13.2 | 10.7 | | | | |
| East Asia & Pacific | 73.4 | 116.4 | 63.9 | 123.9 | 42.7 | 85.6 | 5.9 | 10.9 | | | | |
| Europe & Central Asia | .. | 36.4 | .. | 36.2 | .. | 24.7 | .. | 10.7 | | | | |
| Latin America & Carib. | 59.3 | 37.8 | 25.4 | 29.6 | 17.7 | 21.4 | 22.3 | 15.5 | | | | |
| Middle East & N. Africa | 69.3 | 70.0 | 61.6 | 61.8 | 30.3 | 36.7 | 14.2 | 9.5 | | | | |
| South Asia | 48.9 | 51.1 | 41.0 | 53.1 | 25.2 | 36.0 | 12.7 | 7.6 | | | | |
| Sub-Saharan Africa | 56.8 | 76.6 | 32.5 | 34.2 | 17.2 | 14.0 | 11.9 | 10.1 | | | | |
| High income | 132.3 | 173.8 | 92.5 | 101.8 | .. | 76.9 | 1.8 | 1.1 | | | | |
| Europe EMU | 96.8 | 118.1 | .. | .. | .. | .. | 4.1 | 1.3 | | | | |



About the data

The organization and performance of financial activities in a country affect economic growth through their impact on how businesses raise and manage funds. Savers accumulate claims on financial institutions, which pass these funds to their final users. But even if a country has savings, growth may not materialize because the markets are not perfect and the financial system can fail to direct those savings where they can be invested most efficiently. Households and institutions save and invest independently. The financial system's role is to intermediate between them and to cycle available funds to where they are needed. This is accomplished through established payments systems, available price information, a way to manage uncertainty and control risk, and mechanisms to deal with problems of asymmetric information between parties to a financial transaction. As an economy develops, this indirect lending by savers to investors becomes more efficient and gradually increases financial assets relative to GDP.

As more specialized savings and financial institutions emerge, more financing instruments become available, spreading risks and reducing costs to liability holders. As securities markets mature, savers can invest their resources directly in financial assets issued by firms. There are big differences in financial systems across countries; banks, nonbanks, and stock markets are larger, more active, and more efficient in richer countries.

The ratio of domestic credit provided by the banking sector to GDP is used to measure the growth of the banking system because it reflects the extent to which savings are financial. In a few countries governments may hold international reserves as deposits in the banking system rather than in the central bank. Since the claims on the central government are a net item (claims of central government minus central government deposits), this net figure may be negative, resulting in a negative figure for domestic credit provided by the banking sector.

Liquid liabilities include bank deposits of generally less than one year plus currency. Their ratio to GDP indicates the relative size of these readily available forms of money—money that the owners can use to buy goods and services without incurring any cost. This is a general indicator of the size of financial intermediaries relative to the size of the economy, or an overall measure of financial sector development. Quasi-liquid liabilities are long-term deposits and assets—such as certificates of deposit, commercial paper, and bonds—that can be converted into currency or demand deposits, but at a cost. The ratio of bank liquid reserves to bank assets captures the banking system's liquidity. In countries whose banking system is liquid, adverse macroeconomic conditions should be less likely to lead to banking and financial crises. Data on domestic credit and liquid and quasi-liquid liabilities are cited on an end-of-year basis.

No less important than the size and structure of the financial sector is its efficiency, as indicated by the margin between the cost of mobilizing liabilities and the earnings on assets—or the interest rate spread. A narrowing of the interest rate spread reduces transactions costs, which lowers the overall cost of investment and is therefore crucial to economic growth. Interest rates reflect the responsiveness of financial institutions to competition and price incentives. The interest rate spread, also known as the intermediation margin, is a summary measure of a banking system's efficiency. To the extent that information about interest rates is inaccurate, banks do not monitor all bank managers, or the government sets deposit and lending rates, the interest rate spread may not be a reliable measure of efficiency. The spread over LIBOR reflects the differential between a country's lending rate and the London interbank offered rate (ignoring expected changes in the exchange rate). Interest rates are expressed as annual averages.

In some countries financial markets are distorted by restrictions on foreign investment, selective credit controls, and controls on deposit and lending rates. Interest rates may reflect the diversion of resources to finance the public sector deficit through statutory reserve requirements and direct borrowing from the banking system. And where state-owned banks dominate the financial sector, noncommercial considerations may unduly influence credit allocation. The indicators in the table provide quantitative assessments of each country's financial sector, but qualitative assessments of policies, laws, and regulations are needed to analyze overall financial conditions. Recent international financial crises highlight the risks of weak financial intermediation, poor corporate governance, and deficient government policies, including procyclical macroeconomic policy responses to large capital inflows.

The accuracy of financial data depends on the quality of accounting systems, which are weak in some developing economies. Some of the indicators in the table are highly correlated, particularly the ratios of domestic credit, liquid liabilities, and quasi-liquid liabilities to GDP, because changes in liquid and quasi-liquid liabilities flow directly from changes in domestic credit. Moreover, the precise definition of the financial aggregates presented varies by country.

The indicators reported here do not capture the activities of the informal sector, which remains an important source of finance in developing economies. Personal credit or credit extended through community-based pooling of assets may be the only source of credit available to small farmers, small businesses, or home-based producers. And in financially repressed economies the rationing of formal credit forces many borrowers and lenders to turn to the informal market, which is very expensive, or to self-financing and family savings.

Definitions

- **Domestic credit provided by banking sector** includes all credit to various sectors on a gross basis, with the exception of credit to the central government, which is net. The banking sector includes monetary authorities, deposit money banks, and other banking institutions for which data are available (including institutions that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other banking institutions include savings and mortgage loan institutions and building and loan associations.
- **Liquid liabilities** are also known as broad money, or M3. They are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents.
- **Quasi-liquid liabilities** are the M3 money supply less M1.
- **Ratio of bank liquid reserves to bank assets** is the ratio of domestic currency holdings and deposits with the monetary authorities to claims on other governments, nonfinancial public enterprises, the private sector, and other banking institutions.
- **Interest rate spread** is the interest rate charged by banks on loans to prime customers minus the interest rate paid by commercial or similar banks for demand, time, or savings deposits.
- **Spread over LIBOR** (London interbank offered rate) is the interest rate charged by banks on short-term loans in local currency to prime customers minus LIBOR. LIBOR is the most commonly recognized international interest rate and is quoted in several currencies. The average three-month LIBOR on U.S. dollar deposits is used here.

Data sources

The data on credit, liabilities, bank reserves, and interest rates are collected from central banks and finance ministries and reported in the print and electronic editions of the International Monetary Fund's *International Financial Statistics*.



5.5 | Tax policies

| | Tax revenue | Taxes on income, profits, and capital gains | | Domestic taxes on goods and services | | Export duties | | Import duties | | Highest marginal tax rate ^a | | |
|--------------------------|-------------|---------------------------------------------|------|-------------------------------------------|------|------------------|------|------------------|------|----------------------------------------|-------------------|------------------|
| | % of GDP | % of total taxes | | % of value added in industry and services | | % of tax revenue | | % of tax revenue | | Individual rate % | on income over \$ | Corporate rate % |
| | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 2000 | 2000 | 2000 |
| Afghanistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Albania | 14.8 | .. | 9.4 | .. | 16.9 | .. | 0.0 | .. | 19.3 | .. | .. | .. |
| Algeria | 27.6 | .. | 72.3 | .. | 3.7 | .. | 0.0 | .. | 15.3 | .. | .. | .. |
| Angola | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Argentina | 12.9 | 2.7 | 18.7 | 2.2 | 6.7 | 9.3 | 0.1 | 2.6 | 5.2 | 35 | 120,000 | 35 |
| Armenia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Australia | 21.9 | 70.9 | 72.8 | 5.8 | 5.4 | 0.1 | 0.0 | 4.4 | 2.8 | 47 | 33,324 | 34 |
| Austria | 35.0 | 20.8 | 27.0 | 10.0 | 10.6 | 0.0 | .. | 1.6 | .. | 50 | 47,900 | 34 |
| Azerbaijan | 16.7 | .. | 23.1 | .. | 8.9 | .. | 0.0 | .. | 9.0 | 35 | 12,987 | 27 |
| Bangladesh | 7.0 | .. | 14.5 | .. | 5.0 | .. | 0.0 | .. | 30.0 | .. | .. | .. |
| Belarus | 26.8 | 12.1 | 11.7 | 17.1 | 15.4 | 3.6 | .. | 0.4 | .. | .. | .. | .. |
| Belgium | 43.0 | 17.0 | 13.9 | 10.4 | .. | 0.0 | 0.0 | 6.9 | 1.2 | 55 | 56,433 | 39 |
| Benin | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Bolivia | 14.2 | 7.9 | 9.9 | 5.8 | 11.1 | 0.0 | 0.0 | 11.1 | 7.1 | 13 | 0 | 25 |
| Bosnia and Herzegovina | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Botswana | .. | 71.7 | .. | 1.0 | .. | 0.0 | .. | 24.7 | .. | 25 | 14,920 | 15 |
| Brazil | 20.6 | 24.5 | 24.4 | 7.1 | 6.7 | 0.0 | 0.0 | 2.5 | 3.5 | 28 | 11,077 | 15 |
| Bulgaria | 28.9 | 40.6 | 15.9 | 10.4 | 18.2 | 0.0 | 0.0 | 2.5 | 3.0 | 38 | 8,094 | 20 |
| Burkina Faso | .. | 24.7 | .. | 4.9 | .. | 1.1 | .. | 33.1 | .. | .. | .. | .. |
| Burundi | 16.7 | 23.4 | 22.5 | 16.6 | 17.0 | 3.1 | 0.0 | 23.2 | 16.4 | .. | .. | .. |
| Cambodia | .. | .. | .. | .. | .. | .. | .. | .. | .. | 20 | 38,412 | 20 |
| Cameroon | 12.8 | 25.1 | 26.0 | 4.3 | 6.9 | 1.7 | 3.9 | 18.9 | 31.6 | 60 | 10,726 | 39 |
| Canada | 20.1 | 59.3 | 58.4 | 4.2 | .. | 0.0 | 0.0 | 3.2 | 1.4 | 29 | 40,038 | 38 |
| Central African Republic | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chad | .. | 20.3 | .. | 3.9 | .. | .. | .. | .. | .. | .. | .. | .. |
| Chile | 19.0 | 15.8 | 22.9 | 10.4 | 12.7 | .. | .. | .. | .. | 45 | 5,529 | 15 |
| China | 6.8 | 49.8 | 6.8 | 1.5 | 6.5 | 0.0 | 0.0 | 22.1 | 6.6 | 45 | 12,089 | 30 |
| Hong Kong, China | .. | .. | .. | .. | .. | .. | .. | .. | .. | 17 | 13,462 | 16 |
| Colombia | 10.8 | 36.4 | 39.9 | 4.8 | 6.2 | 2.0 | 0.0 | 22.5 | 8.5 | 35 | 34,375 | 35 |
| Congo, Dem. Rep. | .. | 28.5 | 33.1 | 2.6 | .. | 4.1 | 1.7 | 45.1 | 35.9 | 60 | 1,500 | 40 |
| Congo, Rep. | 6.0 | 40.2 | 11.3 | 4.1 | 4.1 | 0.0 | 0.0 | 32.3 | 22.9 | 50 | 14,210 | 45 |
| Costa Rica | 18.8 | 11.5 | 14.5 | 8.7 | 10.1 | 8.0 | 0.2 | 18.2 | 4.5 | 25 | 16,746 | 30 |
| Côte d'Ivoire | 20.1 | 18.1 | 22.7 | 8.9 | 5.1 | 3.7 | 13.1 | 28.4 | 34.7 | 10 | 3,432 | 35 |
| Croatia | 38.4 | 17.4 | 9.5 | 9.6 | 25.0 | 0.0 | 0.0 | 3.6 | 6.4 | 35 | 5,437 | .. |
| Cuba | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | 32.2 | .. | 13.8 | .. | 13.7 | .. | 0.0 | .. | 2.2 | 32 | 8,587 | 31 |
| Denmark | 31.5 | 43.5 | 40.2 | 18.9 | 19.3 | 0.0 | 0.0 | 0.1 | 0.0 | 59 | .. | 30 |
| Dominican Republic | 15.2 | 23.8 | 19.5 | 3.1 | 5.5 | 0.1 | 0.0 | 41.4 | 40.0 | 25 | 15,165 | 25 |
| Ecuador | .. | 62.9 | .. | 4.5 | .. | 0.3 | .. | 12.1 | .. | 25 | 11,201 | 25 |
| Egypt, Arab Rep. | .. | 26.4 | .. | 4.1 | .. | 0.0 | .. | 18.9 | .. | 32 | 12,987 | 40 |
| El Salvador | 13.2 | .. | 24.2 | .. | 7.2 | .. | 0.0 | .. | 8.1 | 30 | 22,857 | 25 |
| Eritrea | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Estonia | 28.3 | 27.5 | 15.8 | 14.8 | 15.9 | 0.0 | 0.0 | 0.8 | 0.1 | 26 | .. | 35 |
| Ethiopia | .. | 40.9 | .. | 9.1 | .. | 2.8 | .. | 18.0 | .. | .. | .. | .. |
| Finland | 27.8 | 34.5 | 33.6 | 17.7 | 16.9 | 0.0 | 0.0 | 1.0 | 0.0 | 37 | 50,940 | 29 |
| France | .. | 18.7 | .. | 13.1 | .. | 0.0 | .. | 0.0 | .. | .. | .. | 33 |
| Gabon | .. | 35.9 | .. | 5.0 | .. | 2.8 | .. | 23.4 | .. | 50 | 31,462 | 35 |
| Gambia, The | .. | 13.7 | .. | 12.2 | .. | 0.2 | .. | 45.6 | .. | .. | .. | .. |
| Georgia | 10.0 | .. | 8.8 | .. | 9.8 | .. | 0.0 | .. | 7.4 | .. | .. | .. |
| Germany | 26.3 | 17.5 | 17.3 | 6.8 | 7.1 | 0.0 | 0.0 | 0.0 | 0.0 | 53 | 54,617 | 25 |
| Ghana | .. | 25.1 | .. | 6.8 | .. | 12.4 | .. | 28.7 | .. | 30 | 7,059 | 33 |
| Greece | 21.9 | 23.3 | 41.6 | 14.5 | 16.0 | 0.0 | 0.0 | 0.1 | 0.1 | 43 | 46,625 | 35 |
| Guatemala | .. | .. | .. | .. | .. | .. | .. | .. | .. | 31 | 38,155 | 31 |
| Guinea | 11.3 | 12.6 | 10.1 | 3.2 | 0.9 | 51.7 | 0.2 | 11.2 | 42.9 | .. | .. | .. |
| Guinea-Bissau | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Haiti | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Honduras | .. | .. | .. | .. | .. | .. | .. | .. | .. | 25 | 32,916 | 15 |



| | Tax revenue | Taxes on income, profits, and capital gains | | Domestic taxes on goods and services | | Export duties | | Import duties | | Highest marginal tax rate ^a | | | |
|--------------------|-------------|---------------------------------------------|------------------|--------------------------------------|-------------------------------------------|---------------|------------------|---------------|------------------|----------------------------------------|-------------------|-------------------|------------------|
| | | % of GDP 2000 | % of total taxes | | % of value added in industry and services | | % of tax revenue | | % of tax revenue | | Individual rate % | on income over \$ | Corporate rate % |
| | | | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 2000 | 2000 | 2000 |
| Hungary | 32.8 | 21.2 | 23.4 | 22.6 | 15.3 | 1.3 | 0.0 | 5.6 | 3.3 | 40 | 3,512 | 18 | |
| India | 9.6 | 18.6 | 35.8 | 7.4 | 5.2 | 0.1 | 0.1 | 35.8 | 26.7 | 30 | 3,222 | 40 | |
| Indonesia | 16.5 | 65.4 | 64.5 | 5.6 | 6.2 | 0.1 | 0.5 | 6.6 | 2.3 | 35 | 20,949 | 30 | |
| Iran, Islamic Rep. | 9.2 | 24.7 | 41.7 | 1.0 | 1.8 | 0.0 | 0.0 | 18.6 | 14.4 | 54 | 174,583 | 54 | |
| Iraq | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Ireland | .. | 39.7 | .. | 15.5 | .. | 0.0 | .. | 0.0 | .. | 42 | 23,912 | 32 | |
| Israel | 37.7 | 42.4 | 45.7 | .. | .. | 0.0 | 0.0 | 1.4 | 0.8 | 50 | 54,647 | 36 | |
| Italy | 38.5 | 37.7 | 38.8 | 12.7 | 11.6 | 0.0 | 0.0 | 0.0 | 0.0 | 46 | 64,207 | 36 | |
| Jamaica | 23.3 | .. | 43.1 | .. | 9.8 | .. | 0.0 | .. | 9.3 | 25 | 2,327 | 33 | |
| Japan | .. | 73.0 | .. | 2.4 | .. | 0.0 | .. | 1.4 | .. | 37 | 156,863 | 30 | |
| Jordan | 19.8 | 22.9 | 13.7 | 6.8 | 10.7 | 0.0 | 0.0 | 34.7 | 23.7 | .. | .. | .. | |
| Kazakhstan | 10.2 | .. | 31.2 | .. | 6.3 | .. | 0.0 | .. | 4.7 | 30 | .. | 30 | |
| Kenya | 21.2 | 32.9 | 37.9 | 15.9 | 15.2 | 0.0 | 0.0 | 17.8 | 16.8 | 30 | 5,612 | 30 | |
| Korea, Dem. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Korea, Rep. | .. | 37.5 | .. | 6.7 | .. | 0.0 | .. | 13.0 | .. | 40 | 63,507 | 28 | |
| Kuwait | 3.4 | 19.5 | 8.2 | 0.0 | .. | 0.0 | 0.0 | 76.8 | 0.0 | 0 | .. | 0 | |
| Kyrgyz Republic | 12.3 | .. | 18.0 | .. | 17.2 | .. | .. | .. | .. | .. | .. | 30 | |
| Lao PDR | .. | .. | .. | .. | .. | .. | .. | .. | .. | 40 | 658 | .. | |
| Latvia | 25.3 | .. | 13.5 | .. | 14.0 | .. | 0.0 | .. | 1.3 | 25 | .. | 25 | |
| Lebanon | 14.1 | .. | 15.1 | .. | 4.9 | .. | .. | .. | 39.0 | .. | .. | .. | |
| Lesotho | 34.4 | 12.7 | 23.2 | 13.0 | 7.4 | 0.2 | .. | 63.6 | .. | .. | .. | .. | |
| Liberia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Libya | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Lithuania | 22.8 | 22.2 | 12.9 | 16.4 | 14.1 | .. | 0.0 | .. | 1.4 | 33 | .. | 24 | |
| Macedonia, FYR | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Madagascar | 11.3 | 15.7 | 15.7 | 3.6 | 5.5 | 8.5 | 0.0 | 50.1 | 53.5 | .. | .. | .. | |
| Malawi | .. | 42.5 | .. | 13.9 | .. | 0.0 | .. | 18.7 | .. | 38 | 948 | 38 | |
| Malaysia | .. | 42.5 | .. | 6.3 | .. | 9.7 | .. | 15.1 | .. | 29 | 39,474 | 28 | |
| Mali | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Mauritania | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Mauritius | 19.1 | 15.2 | 13.1 | 6.4 | 10.0 | 4.6 | 0.0 | 45.7 | 31.5 | 25 | 894 | 15 | |
| Mexico | 12.3 | 34.2 | 41.1 | 10.2 | 9.2 | 0.1 | 0.0 | 6.9 | 4.8 | 40 | 258,269 | 35 | |
| Moldova | 21.1 | .. | 4.1 | .. | 19.7 | .. | 0.0 | .. | 4.1 | .. | .. | .. | |
| Mongolia | 21.5 | 28.2 | 16.0 | 9.3 | 15.7 | 0.0 | 2.3 | 19.6 | 7.7 | .. | .. | .. | |
| Morocco | 25.0 | 27.3 | 28.5 | 12.1 | 12.7 | 0.3 | 0.0 | 20.3 | 18.8 | 44 | 5,758 | 35 | |
| Mozambique | .. | .. | .. | .. | .. | .. | .. | .. | .. | 20 | 640 | 35 | |
| Myanmar | 2.8 | 29.8 | 35.1 | 6.8 | 3.8 | 0.0 | 0.0 | 23.3 | 8.9 | 30 | .. | 30 | |
| Namibia | 29.5 | 39.4 | 35.3 | 9.0 | 11.8 | 3.6 | .. | 26.9 | .. | 36 | 25,641 | 35 | |
| Nepal | 8.7 | 13.0 | 21.0 | 6.6 | 6.5 | 0.4 | 1.3 | 37.0 | 31.1 | .. | .. | .. | |
| Netherlands | .. | 33.6 | .. | 11.4 | .. | 0.0 | .. | 0.0 | .. | 52 | 43,091 | 35 | |
| New Zealand | 29.0 | 62.2 | 66.3 | 13.4 | .. | 0.0 | 0.0 | 2.5 | 2.0 | 39 | 26,584 | 33 | |
| Nicaragua | 27.6 | 20.0 | 14.1 | 16.9 | 24.7 | 0.0 | 0.0 | 21.3 | 7.8 | 25 | 31,545 | 25 | |
| Niger | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Nigeria | .. | .. | .. | .. | .. | .. | .. | .. | .. | 25 | 1,553 | 30 | |
| Norway | 34.5 | 21.7 | 25.6 | 17.0 | 18.7 | 0.1 | 0.0 | 0.6 | 0.7 | 28 | 6,835 | 28 | |
| Oman | 6.4 | 87.6 | 79.8 | 0.3 | .. | 0.0 | 0.0 | 7.8 | 8.4 | 0 | .. | 12 | |
| Pakistan | 12.1 | 12.8 | 28.1 | 8.6 | 7.9 | 0.0 | 0.0 | 44.4 | 16.0 | 35 | 17,271 | .. | |
| Panama | 18.2 | 24.4 | 29.3 | 4.8 | .. | 1.3 | 0.0 | 15.8 | .. | 30 | 200,000 | 30 | |
| Papua New Guinea | 18.4 | 47.0 | 51.3 | 5.0 | 2.9 | 2.1 | 5.1 | 29.3 | 27.8 | 47 | 31,066 | 25 | |
| Paraguay | .. | 12.4 | .. | 3.6 | .. | 0.0 | .. | 18.8 | .. | 0 | .. | 30 | |
| Peru | 13.3 | 5.8 | 24.7 | 6.7 | 9.0 | 7.6 | 0.0 | 9.9 | 11.5 | 20 | 45,957 | 30 | |
| Philippines | 13.9 | 32.5 | 44.3 | 6.4 | 5.0 | 0.0 | 0.0 | 28.4 | 20.7 | 32 | 10,000 | 32 | |
| Poland | 28.0 | .. | 20.9 | .. | 13.9 | .. | 0.0 | .. | 2.6 | 40 | 17,908 | 28 | |
| Portugal | 31.1 | 25.7 | 29.6 | 13.2 | 15.1 | 0.0 | 0.0 | 2.6 | 0.0 | 40 | 46,967 | 34 | |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | 33 | 50,000 | 20 | |
| Romania | 27.0 | 21.0 | 18.1 | 15.3 | 13.2 | 0.0 | 0.0 | 0.6 | 5.6 | 40 | 2,359 | 25 | |
| Russian Federation | 21.6 | .. | 13.7 | .. | 9.4 | .. | 10.8 | .. | 4.2 | 13 | 6,036 | 35 | |



5.5 | Tax policies

| | Tax revenue % of GDP 2000 | Taxes on income, profits, and capital gains | | Domestic taxes on goods and services | | Export duties | | Import duties | | Highest marginal tax rate ^a | | |
|-----------------------|-------------------------------------|---------------------------------------------|------|-------------------------------------------|------|------------------|------|------------------|------|----------------------------------------|-------------------|------------------|
| | | % of total taxes | | % of value added in industry and services | | % of tax revenue | | % of tax revenue | | Individual rate % | Corporate rate % | Corporate rate % |
| | | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 1990 | 2000 | 2000 | on income over \$ | 2000 |
| Rwanda | .. | 20.0 | .. | 5.6 | .. | 7.4 | .. | 20.7 | .. | .. | .. | .. |
| Saudi Arabia | .. | .. | .. | .. | .. | .. | .. | .. | .. | 0 | .. | 30 |
| Senegal | .. | .. | .. | .. | .. | .. | .. | .. | .. | 50 | 22,469 | 35 |
| Sierra Leone | 6.8 | 33.0 | 26.9 | 1.9 | 2.8 | 0.4 | 0.0 | 41.3 | 49.8 | .. | .. | .. |
| Singapore | 15.5 | 44.6 | 50.2 | 4.3 | 4.8 | 0.0 | 0.0 | 3.5 | 2.5 | 28 | 400,000 | 26 |
| Slovak Republic | 31.1 | .. | 21.7 | .. | 11.8 | .. | 0.0 | .. | 4.7 | 42 | 24,115 | 29 |
| Slovenia | 36.7 | 12.3 | 14.9 | 12.7 | 17.6 | .. | 0.0 | .. | 2.6 | 42 | .. | 25 |
| Somalia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 25.9 | 55.0 | 55.7 | 10.3 | 10.5 | 0.0 | 0.0 | 3.9 | 3.2 | 45 | 15,000 | 30 |
| Spain | .. | 34.0 | .. | 7.6 | .. | 0.0 | .. | 1.7 | .. | 40 | 67,744 | 35 |
| Sri Lanka | 14.5 | 12.0 | 15.1 | 14.7 | 13.7 | 4.2 | 0.0 | 27.4 | 13.1 | 35 | 3,630 | 35 |
| Sudan | 6.8 | .. | 18.3 | .. | 5.1 | .. | 0.8 | .. | 35.5 | .. | .. | .. |
| Swaziland | 27.5 | 33.2 | 26.4 | 5.4 | 6.8 | 2.0 | 0.0 | 50.5 | 54.7 | 39 | 5,089 | 30 |
| Sweden | 35.1 | 20.6 | 15.5 | 14.5 | 12.3 | 0.0 | 0.0 | 0.6 | 0.0 | 31 | 27,198 | 28 |
| Switzerland | 22.3 | 17.0 | 13.9 | .. | 6.0 | 0.0 | 0.0 | 6.9 | 1.2 | .. | .. | 45 |
| Syrian Arab Republic | 15.7 | 40.2 | 48.9 | 9.6 | 5.5 | 1.3 | 3.1 | 8.2 | 13.6 | .. | .. | .. |
| Tajikistan | 9.7 | .. | 3.4 | .. | 7.9 | .. | 0.0 | .. | 14.7 | .. | .. | .. |
| Tanzania | .. | .. | .. | .. | .. | .. | .. | .. | .. | 30 | 8,000 | 30 |
| Thailand | 14.1 | 26.2 | 34.0 | 8.8 | 7.7 | 0.2 | 0.3 | 23.7 | 12.3 | 37 | 92,829 | 30 |
| Togo | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Trinidad and Tobago | .. | .. | .. | .. | .. | .. | .. | .. | .. | 35 | 8,012 | 35 |
| Tunisia | 26.0 | 16.0 | 22.3 | 7.1 | 12.5 | 0.4 | 0.1 | 35.1 | 12.5 | .. | .. | .. |
| Turkey | 22.0 | 51.2 | 37.4 | 5.9 | 16.0 | 0.0 | 0.0 | 7.3 | 1.7 | 40 | 104,353 | 30 |
| Turkmenistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Uganda | 10.3 | .. | 18.0 | .. | 12.9 | .. | 0.0 | .. | 11.0 | 30 | 2,795 | 30 |
| Ukraine | 22.1 | .. | 15.2 | .. | 12.2 | .. | 0.0 | .. | 4.1 | 40 | 3,754 | 30 |
| United Arab Emirates | 1.8 | 0.0 | 0.0 | 0.6 | .. | .. | .. | .. | .. | 0 | .. | 20 |
| United Kingdom | 34.6 | 43.2 | 41.8 | 11.3 | 13.0 | 0.0 | 0.0 | 0.0 | 0.0 | 40 | 43,815 | 30 |
| United States | 20.1 | 56.1 | 61.3 | .. | .. | 0.0 | 0.0 | 1.7 | 1.0 | 40 | 297,350 | 35 |
| Uruguay | 24.9 | 7.1 | 16.9 | 9.4 | 10.2 | 0.6 | 0.1 | 8.1 | 3.0 | 0 | .. | 30 |
| Uzbekistan | .. | .. | .. | .. | .. | .. | .. | .. | .. | 36 | 603 | 26 |
| Venezuela, RB | 12.9 | 82.2 | 42.9 | 0.8 | 4.9 | 0.0 | 0.0 | 7.1 | 11.3 | 34 | 99,445 | 34 |
| Vietnam | 14.9 | .. | 32.0 | .. | 8.0 | .. | 0.0 | .. | 20.7 | 50 | 5,695 | 32 |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | 9.7 | 44.9 | 45.9 | 2.5 | 2.7 | 0.0 | 0.0 | 29.2 | 25.9 | .. | .. | .. |
| Yugoslavia, Fed. Rep. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Zambia | .. | .. | .. | .. | .. | .. | .. | .. | .. | 30 | 524 | 35 |
| Zimbabwe | .. | 49.7 | .. | 8.4 | .. | 0.0 | .. | 18.8 | .. | 53 | 14,756 | 30 |

a. These data are from PricewaterhouseCoopers's *Individual Taxes: Worldwide Summaries 2001-2002* and *Corporate Taxes: Worldwide Summaries 2001-2002*, copyright 2001 by PricewaterhouseCoopers by permission of John Wiley and Sons, Inc.



About the data

Tax revenue is the main source of revenue for many governments. The sources of the tax revenue received by governments and the relative contributions of these sources are determined by policy choices about where and how to impose taxes and by changes in the structure of the economy. Tax policy may reflect concerns about distributional effects, economic efficiency (including corrections for externalities), and the practical problems of administering a tax system. There is no ideal level of taxation. But taxes influence incentives and thus the behavior of economic actors and the country's competitiveness.

Taxes are compulsory transfers received by the government sector from individuals, businesses, or institutions. They include fees that are clearly out of all proportion to the costs of providing services, but exclude compulsory social contributions, fines, and penalties. They are considered unrequited because governments provide nothing specifically in return for them, although taxes typically are used to provide goods or services to individuals or communities on a collective basis.

The level of taxation is typically measured by tax revenue as a share of GDP. Comparing levels of taxation across countries provides a quick overview of the fiscal obligations and incentives facing the private sector. In this table tax data measured in local currencies are normalized by scaling variables in the same units to ease cross-country comparisons. The table refers only to central government data, which may significantly understate the total tax burden, particularly in countries where provincial and municipal governments are large or have considerable tax authority.

Low ratios of tax collections to GDP may reflect weak administration and large-scale tax avoidance or evasion. They may also reflect the presence of a sizable parallel economy with unrecorded and undisclosed incomes. Tax collection ratios tend to rise with income, with higher-income countries relying on taxes to finance a much broader range of social services and social security than lower-income countries are able to provide.

As countries develop, their capacity to tax residents directly typically expands and indirect taxes become less important as a source of revenue. Thus the share of taxes on income, profits, and capital gains is one measure of an economy's (and tax system's) level of development. In the early stages of development governments tend to rely on indirect taxes because the administrative costs of collecting them are relatively low. The two main indirect taxes are international trade taxes (including customs revenues) and domestic taxes on goods and services. The table shows these domestic taxes as a percentage of value added in industry and

services. Agriculture and mining are excluded from the denominator because indirect taxes on goods originating from these sectors are usually negligible. What is missing here is a measure of the uniformity of these taxes across industries and along the value added chain of production. Without such data no clear inferences can be drawn about how neutral a tax system is between subsectors. "Surplus" revenues raised by some governments by charging higher prices for goods produced under monopoly by state-owned enterprises are not counted as tax revenues. Similarly, losses from charging below-market prices for products are rarely identified as subsidies.

Export and import duties are shown separately because the burden they impose on the economy (and thus growth) is likely to be large. Export duties, typically levied on primary (particularly agricultural) products, often take the place of direct taxes on income and profits, but they reduce the incentive to export and encourage a shift to other products. High import duties penalize consumers, create protective barriers—which promote higher-priced output and inefficient production—and implicitly tax exports. By contrast, lower trade taxes enhance openness—to foreign competition, knowledge, technologies, and resources—energizing development in many ways. The economies growing fastest over the past 15 years have not relied on tax revenues from imports. Seeing this pattern, many developing countries have lowered tariffs over the past decade, a trend that is expected to continue. In some countries, such as members of the European Union, most customs duties are collected by a supranational authority; these revenues are not reported in the individual countries' accounts.

The tax revenues collected by governments are the outcomes of systems that are often complex, containing many exceptions, exemptions, penalties, and other inducements that affect the incidence of taxes and thus influence the decisions of workers, managers, and entrepreneurs. A potentially important influence on both domestic and international investors is a tax system's progressivity, as reflected in the highest marginal tax rate on individual and corporate income. Figures for individual marginal tax rates generally refer to employment income. For some countries the highest marginal tax rate is also the basic or flat rate, and other surtaxes, deductions, and the like may apply.

Definitions

• **Tax revenue** comprises compulsory transfers to the central government for public purposes. Compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue. • **Taxes on income, profits, and capital gains** are levied on wages, salaries, tips, fees, commissions and other compensation for labor services; interest, dividends, rent, and royalties; capital gains and losses; and profits of businesses, estates, and trusts. Social security contributions based on gross pay, payroll, or number of employees are not included, but taxable portions of social security, pension, and other retirement account distributions are included. • **Domestic taxes on goods and services** include all taxes and duties levied by central governments on the production, extraction, sale, transfer, leasing, or delivery of goods and rendering of services, or on the use of goods or permission to use goods or perform activities. These include value added taxes, general sales taxes, single-stage and multi-stage taxes (where "stage" refers to stage of production or distribution), excise taxes, and motor vehicle taxes, and taxes on the extraction, processing, or production of minerals or other products. • **Export duties** include all levies collected on goods at the point of export. Rebates on exported goods that are repayments of previously paid general consumption taxes, excise taxes, or import duties are deducted from the gross amounts receivable from the respective taxes, not from amounts receivable in this category. • **Import duties** comprise all levies collected on goods at the point of entry into the country. The levies may be imposed for revenue or protection purposes and may be determined on a specific or ad valorem basis, as long as they are restricted to imported products. • **Highest marginal tax rate** is the highest rate shown on the schedule of tax rates applied to the annual taxable income of individuals and corporations. Also presented are the income levels above which the highest marginal tax rates for individuals apply.

Data sources

The definitions used here are from the International Monetary Fund's (IMF) *Manual on Government Finance Statistics* (2001). The data on tax revenues are from print and electronic editions of the IMF's *Government Finance Statistics Yearbook*. The data on individual and corporate tax rates are from PricewaterhouseCoopers's *Individual Taxes: Worldwide Summaries 2001-02* and *Corporate Taxes: Worldwide Summaries 2001-02*.



5.6 | Relative prices and exchange rates

| | Exchange rate arrangements ^a | | Official exchange rate local currency units to \$ 2000 | Purchasing power parity conversion factor | | PPP conversion factor/ official exchange rate ratio 2000 | Real effective exchange rate 1995=100 2000 | Interest rate | | | Key agricultural producer prices | |
|--------------------------|-----------------------------------------|-------------------|------------------------------------------------------------------|-------------------------------------------|---------|-----------------------------------------------------------------------|------------------------------------------------------|-------------------|-------------------|----------------|----------------------------------|---------------------------------|
| | Classification 2000 | Structure 2000 | | 1990 | 2000 | | | Deposit % 2000 | Lending % 2000 | Real % 2000 | Wheat \$ per metric ton 1998 | Maize \$ per metric ton 1998 |
| Afghanistan | .. | .. | 3,000.0 | 0.0 | .. | .. | .. | .. | .. | .. | 33 | 31 |
| Albania | IF | U | 143.7 | 1.8 | 45.1 | 0.3 | .. | 8.3 | 22.1 | 23.6 | .. | .. |
| Algeria | MF | U | 75.3 | 4.9 | 24.9 | 0.3 | 107.7 | 7.5 | 10.0 | -11.0 | 337 | .. |
| Angola | IF | U | 10.0 | 0.0 | 3.1 | 0.3 | .. | 39.6 | 103.2 | -59.5 | .. | .. |
| Argentina | CB | U | 1.0 | 0.3 | 0.6 | 0.6 | .. | 8.3 | 11.1 | 9.8 | 85 | 56 |
| Armenia | IF | U | 539.5 | 0.0 | 106.1 | 0.2 | 108.7 | 18.1 | 31.6 | 33.4 | .. | .. |
| Australia | IF | U | 1.7 | 1.4 | 1.4 | 0.8 | 94.5 | 4.1 | 8.8 | 5.1 | 127 | 128 |
| Austria | EA/Euro | U | 14.9 ^b | 12.8 | 13.0 | 0.9 | 90.3 | 2.2 | 5.6 | 4.7 | 117 | 117 |
| Azerbaijan | MF | U | 4,474.2 | 0.1 | 997.1 | 0.2 | .. | .. | .. | .. | 204 | 132 |
| Bangladesh | P | U | 52.1 | 9.1 | 11.3 | 0.2 | .. | 8.6 | 15.5 | 13.4 | 172 | 173 |
| Belarus | MF | M | 876.8 | 0.0 | 120.9 | 0.1 | .. | 37.5 | 67.7 | -41.2 | .. | .. |
| Belgium | EA/Euro | U | 43.8 ^b | 34.1 | 35.6 | 0.8 | 87.3 | 3.0 | 4.3 | 3.0 | .. | .. |
| Benin | EA/FF | U | 712.0 | 151.0 | 248.5 | 0.3 | .. | 3.5 | .. | .. | .. | 285 |
| Bolivia | P | U | 6.2 | 1.3 | 2.5 | 0.4 | 117.9 | 11.0 | 34.6 | 29.7 | 195 | 119 |
| Bosnia and Herzegovina | CB | U | 2.1 | 0.0 | .. | .. | .. | .. | 14.7 | 30.5 | .. | .. |
| Botswana | P | D | 5.1 | 1.1 | 2.3 | 0.5 | .. | 10.1 | 15.3 | 3.3 | 90 | 110 |
| Brazil | IF | U | 1.8 | 0.0 | 0.8 | 0.5 | .. | 17.2 | 56.8 | 44.5 | 164 | 125 |
| Bulgaria | CB | U | 2.1 | 0.0 | 0.6 | 0.3 | 120.7 | 3.1 | 11.5 | 5.6 | .. | .. |
| Burkina Faso | EA/FF | U | 712.0 | 133.3 | 141.8 | 0.2 | .. | 3.5 | .. | .. | .. | 148 |
| Burundi | MF | D | 720.7 | 49.2 | 123.4 | 0.2 | 93.1 | .. | 15.8 | -5.8 | 156 | 357 |
| Cambodia | MF | D | 3,840.8 | 66.8 | 703.4 | 0.2 | .. | 6.8 | 17.3 | 15.6 | .. | 158 |
| Cameroon | EA/FF | U | 712.0 | 184.9 | 230.0 | 0.3 | 95.7 | 5.0 | 22.0 | 17.9 | 79 | 120 |
| Canada | IF | U | 1.5 | 1.2 | 1.2 | 0.8 | 99.5 | 5.7 | 7.3 | 3.6 | 87 | 78 |
| Central African Republic | EA/FF | U | 712.0 | 129.7 | 157.4 | 0.2 | 89.8 | 5.0 | 22.0 | 18.1 | .. | 469 |
| Chad | EA/FF | U | 712.0 | 107.5 | 149.5 | 0.2 | .. | 5.0 | 22.0 | 18.0 | 258 | 271 |
| Chile | IF | U | 535.5 | 141.7 | 263.7 | 0.5 | 106.0 | 9.2 | 14.8 | 10.4 | 201 | 148 |
| China | P | U | 8.3 | 1.2 | 1.8 | 0.2 | 107.6 | 2.3 | 5.8 | 4.9 | 134 | 109 |
| Hong Kong, China | CB | U | 7.8 | 6.1 | 7.4 | 1.0 | .. | 4.8 | 9.5 | 17.2 | .. | .. |
| Colombia | IF | U | 2,087.9 | 80.4 | 642.1 | 0.3 | 95.6 | 12.1 | 18.8 | 7.3 | 261 | 156 |
| Congo, Dem. Rep. | IF | U | 21.8 | 0.0 | 0.2 | 0.0 | 264.7 | .. | 165.0 | 12.2 | .. | .. |
| Congo, Rep. | EA/FF | U | 712.0 | 449.7 | 919.0 | 1.3 | .. | 5.0 | 22.0 | -16.6 | .. | 238 |
| Costa Rica | P | U | 308.2 | 32.4 | 148.5 | 0.5 | 106.8 | 13.4 | 24.9 | 16.6 | .. | 179 |
| Côte d'Ivoire | EA/FF | U | 712.0 | 160.5 | 255.6 | 0.4 | 96.5 | 3.5 | .. | .. | .. | 133 |
| Croatia | MF | U | 8.3 | 0.0 | 4.4 | 0.5 | 98.9 | 3.7 | 12.1 | 5.3 | .. | .. |
| Cuba | .. | .. | .. | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Czech Republic | MF | U | 38.6 | 0.0 | 13.6 | 0.4 | 114.8 | 3.4 | 7.2 | 6.3 | .. | .. |
| Denmark | P | U | 8.1 | 8.2 | 8.9 | 1.1 | 93.5 | 3.2 | 8.1 | 4.3 | 127 | .. |
| Dominican Republic | MF | D | 16.4 | 2.5 | 6.4 | 0.4 | 110.3 | 17.7 | 26.8 | 17.7 | .. | 226 |
| Ecuador | EA/Other | U | 24,988.4 | 287.4 | 8,394.4 | 0.3 | 73.3 | 7.4 | 16.3 | -43.5 | 185 | 203 |
| Egypt, Arab Rep. | P | M | 3.5 | 0.7 | 1.5 | 0.4 | .. | 9.5 | 13.2 | 7.0 | 189 | 158 |
| El Salvador | P | U | 8.8 | 2.4 | 4.1 | 0.5 | .. | 9.3 | 14.0 | 9.7 | .. | 220 |
| Eritrea | P | U | .. | 0.0 | 1.7 | .. | .. | .. | .. | .. | .. | .. |
| Estonia | CB | U | 17.0 | 0.1 | 6.1 | 0.4 | .. | 3.8 | 7.6 | 2.2 | .. | .. |
| Ethiopia | MF | U | 8.2 | 0.7 | 1.2 | 0.1 | .. | 6.7 | 10.9 | 9.3 | 205 | 128 |
| Finland | EA/Euro | U | 6.5 ^b | 5.9 | 6.1 | 0.9 | 87.1 | 1.6 | 5.6 | 2.7 | 159 | .. |
| France | EA/Euro | U | 7.1 ^b | 6.5 | 6.5 | 0.9 | 88.4 | 2.6 | 6.7 | 5.7 | 126 | 119 |
| Gabon | EA/FF | U | 712.0 | 330.7 | 457.7 | 0.6 | 89.7 | 5.0 | 22.0 | -5.0 | .. | 163 |
| Gambia, The | IF | U | 12.8 | 1.8 | 2.5 | 0.2 | 95.0 | 12.5 | 24.0 | 19.5 | .. | 241 |
| Georgia | IF | U | 2.0 | 0.0 | 0.4 | 0.2 | 135.7 | 10.2 | 32.8 | 28.6 | 796 | 724 |
| Germany | EA/Euro | U | 2.1 ^b | 1.9 | 1.9 | 0.9 | 84.6 | 3.4 | 9.6 | 10.1 | 124 | 139 |
| Ghana | IF | U | 5,455.1 | 92.7 | 716.2 | 0.1 | 81.1 | 28.6 | .. | .. | .. | 242 |
| Greece | EA/Euro | U | 365.4 ^b | 114.4 | 236.2 | 0.6 | 96.3 | 6.1 | 12.3 | 9.2 | 220 | 171 |
| Guatemala | MF | U | 7.8 | 1.4 | 3.4 | 0.4 | .. | 10.2 | 20.9 | 14.6 | 234 | 156 |
| Guinea | IF | U | 1,746.9 | 212.7 | 358.0 | 0.2 | .. | 7.5 | 19.4 | 10.2 | .. | 226 |
| Guinea-Bissau | EA/FF | U | 712.0 | 12.6 | 169.4 | 0.2 | .. | 3.5 | .. | .. | .. | .. |
| Haiti | IF | U | 21.2 | 1.4 | 6.8 | 0.3 | .. | 11.9 | 25.1 | 9.1 | .. | 271 |
| Honduras | P | U | 14.8 | 1.2 | 5.6 | 0.4 | .. | 15.9 | 26.8 | 16.4 | 51 | 264 |

Relative prices and exchange rates | 5.6



| | Exchange rate arrangements ^a | | Official exchange rate | Purchasing power parity conversion factor | | PPP conversion factor/ official exchange rate | Real effective exchange rate | Interest rate | | | Key agricultural producer prices | |
|--------------------|-----------------------------------------|----------------|---------------------------------|-----------------------------------------------|---------|-----------------------------------------------|------------------------------|----------------|----------------|-------------|----------------------------------|------------------------------|
| | Classification 2000 | Structure 2000 | local currency units to \$ 2000 | local currency units to international \$ 1990 | 2000 | ratio 2000 | 1995=100 2000 | Deposit % 2000 | Lending % 2000 | Real % 2000 | Wheat \$ per metric ton 1998 | Maize \$ per metric ton 1998 |
| Hungary | P | U | 282.2 | 21.3 | 103.5 | 0.4 | 109.7 | 9.6 | 12.6 | 4.8 | 113 | 92 |
| India | MF | U | 44.9 | 4.8 | 8.7 | 0.2 | .. | .. | 12.3 | 6.7 | 142 | 95 |
| Indonesia | IF | U | 8,421.8 | 606.2 | 2,015.6 | 0.2 | .. | 12.5 | 18.5 | 6.7 | .. | 87 |
| Iran, Islamic Rep. | P | D | 1,764.4 | 173.7 | 1,429.4 | 0.8 | 297.7 | .. | .. | .. | 289 | 297 |
| Iraq | P | U | 0.3 | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Ireland | EA/Euro | U | 0.9 ^b | 0.6 | 0.7 | 0.8 | 91.2 | 0.1 | 4.8 | -0.5 | 114 | .. |
| Israel | P | U | 4.1 | 1.7 | 3.6 | 0.9 | 114.2 | 8.6 | 12.9 | 10.7 | 149 | 1,330 |
| Italy | EA/Euro | U | 2,101.6 ^b | 1,335.4 | 1,655.9 | 0.8 | 106.4 | 1.8 | 6.3 | 3.9 | 181 | 161 |
| Jamaica | MF | U | 42.7 | 3.9 | 33.5 | 0.8 | .. | 11.6 | 23.3 | 11.6 | .. | 1,182 |
| Japan | IF | U | 107.8 | 177.2 | 153.7 | 1.4 | 95.6 | 0.1 | 2.1 | 2.2 | 1,295 | 1,082 |
| Jordan | P | U | 0.7 | 0.3 | 0.3 | 0.4 | .. | 7.0 | 11.8 | 12.4 | 379 | 223 |
| Kazakhstan | MF | U | 142.1 | 0.0 | 29.7 | 0.2 | .. | .. | .. | .. | 72 | 85 |
| Kenya | MF | U | 76.2 | 8.6 | 25.6 | 0.3 | .. | 8.1 | 22.3 | 14.5 | 262 | 151 |
| Korea, Dem. Rep. | .. | .. | .. | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Korea, Rep. | IF | U | 1,131.0 | 469.7 | 629.3 | 0.6 | .. | 7.9 | 8.5 | 10.3 | 494 | 398 |
| Kuwait | P | U | 0.3 | 0.0 | 0.4 | 1.2 | .. | 5.9 | 8.9 | .. | .. | .. |
| Kyrgyz Republic | MF | U | 47.7 | 0.0 | 4.7 | 0.1 | .. | 18.4 | 51.9 | 25.0 | 18 | 34 |
| Lao PDR | MF | D | 7,887.6 | 164.7 | 1,621.2 | 0.2 | .. | 12.0 | 32.0 | 6.6 | .. | 96 |
| Latvia | P | U | 0.6 | 0.0 | 0.3 | 0.4 | .. | 4.4 | 11.9 | 7.2 | .. | .. |
| Lebanon | P | U | 1,507.5 | 290.2 | 1,333.0 | 0.9 | .. | 11.2 | 18.2 | 18.6 | 283 | 304 |
| Lesotho | P | U | 6.9 | 0.9 | 1.5 | 0.2 | 78.0 | 4.9 | 17.1 | 10.4 | 195 | 137 |
| Liberia | IF | U | 41.0 | 0.0 | .. | .. | .. | 6.2 | 20.5 | .. | .. | .. |
| Libya | P | D | 0.5 | 0.0 | .. | .. | .. | 3.0 | 7.0 | .. | 897 | 889 |
| Lithuania | CB | U | 4.0 | 0.0 | 1.7 | 0.4 | .. | 3.9 | 12.1 | 9.8 | .. | .. |
| Macedonia, FYR | P | U | 65.9 | 0.1 | 22.8 | 0.3 | 72.8 | 11.2 | 18.9 | 10.1 | .. | .. |
| Madagascar | IF | U | 6,767.5 | 484.1 | 2,012.3 | 0.3 | .. | 15.0 | 26.5 | 18.1 | 102 | 192 |
| Malawi | IF | U | 59.5 | 1.4 | 15.9 | 0.3 | 112.7 | 33.3 | 53.1 | 23.0 | 64 | 35 |
| Malaysia | P | U | 3.8 | 1.4 | 1.6 | 0.4 | 86.6 | 3.4 | 6.8 | 1.9 | .. | 98 |
| Mali | EA/FF | U | 712.0 | 133.8 | 189.4 | 0.3 | .. | 3.5 | .. | .. | 124 | 128 |
| Mauritania | MF | U | 238.9 | 35.3 | 50.0 | 0.2 | .. | .. | .. | .. | 197 | 223 |
| Mauritius | IF | U | 26.2 | 6.6 | 9.7 | 0.4 | .. | 9.6 | 20.8 | 20.8 | .. | 208 |
| Mexico | IF | U | 9.5 | 1.4 | 6.2 | 0.7 | .. | 6.3 | 18.2 | 6.6 | 141 | 146 |
| Moldova | IF | U | 12.4 | 0.0 | 1.8 | 0.1 | 109.8 | 24.9 | 33.8 | 5.3 | .. | .. |
| Mongolia | IF | U | 1,076.7 | 2.6 | 244.1 | 0.2 | .. | 13.8 | 30.3 | 16.7 | .. | .. |
| Morocco | P | U | 10.6 | 3.1 | 3.5 | 0.3 | 108.2 | 5.2 | 13.3 | 11.6 | 255 | 205 |
| Mozambique | IF | U | 15,447.1 | 316.6 | 3,900.2 | 0.3 | .. | 9.7 | 19.0 | 6.6 | 21 | 13 |
| Myanmar | P | D | 6.5 | 0.0 | .. | .. | .. | 9.8 | 15.3 | -5.3 | .. | .. |
| Namibia | P | U | 6.9 | 1.1 | 2.1 | 0.3 | .. | 7.4 | 15.3 | 5.3 | 183 | 154 |
| Nepal | P | U | 71.1 | 6.5 | 12.4 | 0.2 | .. | 6.0 | 9.5 | 5.0 | 119 | 106 |
| Netherlands | EA/Euro | U | 2.4 ^b | 2.1 | 2.1 | 0.9 | 89.9 | 2.9 | 4.8 | 2.2 | 118 | 232 |
| New Zealand | IF | U | 2.2 | 1.5 | 1.4 | 0.6 | 83.3 | 6.4 | 10.2 | 7.4 | 153 | 131 |
| Nicaragua | P | U | 12.7 | 0.0 | 2.5 | 0.2 | 113.1 | 9.4 | 21.4 | 8.7 | .. | 189 |
| Niger | EA/FF | U | 712.0 | 118.8 | 160.9 | 0.2 | .. | 3.5 | .. | .. | 372 | 582 |
| Nigeria | MF | D | 101.7 | 3.5 | 36.8 | 0.4 | 81.0 | 11.7 | 21.3 | -3.3 | 1,555 | 1,201 |
| Norway | MF | U | 8.8 | 8.7 | 10.6 | 1.2 | 96.1 | 6.7 | 8.2 | -6.9 | 528 | .. |
| Oman | P | U | 0.4 | 0.0 | .. | .. | .. | 7.6 | 10.1 | .. | .. | .. |
| Pakistan | MF | U | 53.6 | 5.7 | 12.0 | 0.2 | 93.6 | .. | .. | .. | 125 | 19 |
| Panama | EA/Other | U | 1.0 | 0.6 | 0.6 | 0.6 | .. | 7.1 | 10.2 | 9.3 | .. | 265 |
| Papua New Guinea | IF | U | 2.8 | 0.5 | 0.9 | 0.3 | 92.8 | 14.5 | 17.5 | 1.7 | .. | 84 |
| Paraguay | MF | U | 3,486.4 | 391.3 | 1,078.0 | 0.3 | 97.1 | 15.7 | 26.8 | 16.4 | 109 | 121 |
| Peru | IF | U | 3.5 | 0.1 | 1.5 | 0.4 | .. | 13.3 | 27.9 | 23.4 | 242 | 246 |
| Philippines | IF | U | 44.2 | 5.3 | 11.0 | 0.2 | 89.8 | 8.3 | 10.9 | 4.0 | .. | 138 |
| Poland | IF | U | 4.3 | 0.3 | 2.0 | 0.5 | 121.6 | 14.2 | 20.0 | 12.0 | 164 | 146 |
| Portugal | EA/Euro | U | 217.6 ^b | 91.3 | 132.1 | 0.6 | 96.4 | 2.4 | 5.2 | 1.8 | 147 | 144 |
| Puerto Rico | .. | .. | .. | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | MF | U | 21,708.7 | 5.9 | 5,527.7 | 0.3 | 107.1 | .. | .. | .. | 93 | 73 |
| Russian Federation | MF | M | 28.1 | 0.0 | 5.8 | 0.2 | 90.5 | 6.5 | 24.4 | -9.2 | .. | .. |



5.6 | Relative prices and exchange rates

| | Exchange rate arrangements ^a | | Official exchange rate | Purchasing power parity conversion factor | | PPP conversion factor/official exchange rate | Real effective exchange rate | Interest rate | | | Key agricultural producer prices | |
|-----------------------|-----------------------------------------|----------------|---------------------------------|-----------------------------------------------|-----------|----------------------------------------------|------------------------------|----------------|----------------|-------------|----------------------------------|------------------------------|
| | Classification 2000 | Structure 2000 | local currency units to \$ 2000 | local currency units to international \$ 1990 | 2000 | ratio 2000 | 1995=100 2000 | Deposit % 2000 | Lending % 2000 | Real % 2000 | Wheat \$ per metric ton 1998 | Maize \$ per metric ton 1998 |
| Rwanda | MF | U | 389.7 | 32.3 | 87.2 | 0.2 | .. | 8.9 | .. | .. | 226 | 145 |
| Saudi Arabia | P | U | 3.7 | 2.6 | 2.8 | 0.7 | 108.7 | 6.7 | .. | .. | 387 | 478 |
| Senegal | EA/FF | U | 712.0 | 176.6 | 216.4 | 0.3 | .. | 3.5 | .. | .. | .. | 135 |
| Sierra Leone | IF | D | 2,092.1 | 38.0 | 539.3 | 0.3 | 105.3 | 9.2 | 26.3 | 22.6 | .. | 33 |
| Singapore | MF | U | 1.7 | 1.7 | 1.7 | 1.0 | 95.5 | 1.7 | 5.8 | 3.9 | .. | .. |
| Slovak Republic | MF | U | 46.0 | 5.8 | 14.6 | 0.3 | 109.3 | 8.4 | 14.9 | 7.9 | 101 | 89 |
| Slovenia | MF | U | 222.7 | 0.0 | 116.9 | 0.5 | .. | 10.0 | 15.8 | 9.5 | 198 | 160 |
| Somalia | IF | D | .. | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| South Africa | IF | U | 6.9 | 1.0 | 2.2 | 0.3 | 82.9 | 9.2 | 14.5 | 7.5 | 146 | 103 |
| Spain | EA/Euro | U | 180.6 ^b | 104.9 | 131.3 | 0.7 | 94.2 | 3.0 | 5.2 | 1.7 | 157 | 154 |
| Sri Lanka | MF | U | 77.0 | 9.3 | 18.4 | 0.2 | .. | 9.2 | 16.2 | 8.5 | .. | 218 |
| Sudan | MF | U | 257.1 | 0.8 | 53.0 | 0.2 | .. | .. | .. | .. | 248 | 117 |
| Swaziland | P | U | 6.9 | 0.8 | 2.0 | 0.3 | .. | 6.5 | 14.0 | 2.1 | 188 | 128 |
| Sweden | IF | U | 9.2 | 9.0 | 9.7 | 1.1 | 95.1 | 2.2 | 5.8 | 5.0 | 126 | .. |
| Switzerland | IF | U | 1.7 | 2.0 | 2.0 | 1.2 | 87.3 | 3.0 | 4.3 | 3.0 | 525 | 368 |
| Syrian Arab Republic | P | M | 11.2 | 10.0 | 14.8 | 1.3 | .. | .. | .. | .. | 884 | 823 |
| Tajikistan | IF | U | 2.1 | 0.0 | 0.3 | 0.1 | .. | .. | .. | .. | .. | .. |
| Tanzania | IF | U | 800.4 | 71.9 | 410.4 | 0.5 | .. | 7.4 | 21.6 | 11.5 | 348 | 348 |
| Thailand | IF | U | 40.1 | 10.2 | 12.6 | 0.3 | .. | 3.3 | 7.8 | 5.9 | .. | 87 |
| Togo | EA/FF | U | 712.0 | 91.7 | 133.0 | 0.2 | 98.8 | 3.5 | .. | .. | .. | 216 |
| Trinidad and Tobago | P | U | 6.3 | 2.9 | 4.2 | 0.7 | 115.4 | 8.2 | 16.5 | 6.1 | .. | 349 |
| Tunisia | MF | U | 1.4 | 0.3 | 0.4 | 0.3 | 100.8 | .. | .. | .. | 284 | .. |
| Turkey | IF | U | 625,218.5 | 1,448.4 | 274,484.1 | 0.4 | .. | 47.2 | .. | .. | 133 | 126 |
| Turkmenistan | P | D | 5,200.0 | 0.0 | 1,113.4 | 0.2 | .. | .. | .. | .. | .. | .. |
| Uganda | IF | U | 1,644.5 | 113.0 | 347.6 | 0.2 | 96.0 | 9.8 | 22.9 | 19.0 | 681 | 358 |
| Ukraine | MF | U | 5.4 | 0.0 | 0.9 | 0.2 | 118.4 | 13.7 | 41.5 | 12.9 | .. | .. |
| United Arab Emirates | P | U | 3.7 | 3.4 | 3.5 | 1.0 | .. | .. | .. | .. | .. | .. |
| United Kingdom | IF | U | 0.7 | 0.6 | 0.7 | 1.0 | 131.9 | 4.5 | 6.0 | 4.1 | 118 | 176 |
| United States | IF | U | 1.0 | 1.0 | 1.0 | 1.0 | 125.2 | .. | 9.2 | 7.0 | 99 | 61 |
| Uruguay | P | U | 12.1 | 0.6 | 8.1 | 0.7 | 113.1 | 12.1 | 49.1 | 43.8 | 119 | 125 |
| Uzbekistan | MF | M | 236.6 | 0.0 | 52.9 | 0.2 | .. | .. | .. | .. | .. | .. |
| Venezuela, RB | P | U | 680.0 | 23.1 | 585.0 | 0.9 | 161.6 | 16.3 | 25.2 | -1.3 | 123 | 445 |
| Vietnam | P | U | 14,167.8 | 0.0 | 2,833.3 | 0.2 | .. | 3.7 | 10.6 | 5.0 | .. | .. |
| West Bank and Gaza | .. | .. | .. | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | IF | U | 161.7 | 18.8 | 88.3 | 0.5 | .. | 14.0 | 22.0 | -5.1 | 191 | 221 |
| Yugoslavia, Fed. Rep. | MF | U | .. | 0.0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Zambia | IF | U | 3,110.8 | 17.4 | 1,150.9 | 0.4 | 113.3 | 20.2 | 38.8 | 17.6 | 211 | 79 |
| Zimbabwe | P | U | 44.4 | 0.9 | 9.6 | 0.2 | .. | 50.2 | 68.2 | 5.2 | 211 | 122 |

a. Exchange rate arrangements are given for the end of the year in 2000. Exchange rate classifications include independent floating (IF), managed floating (MF), pegged (P), currency board (CB), and several exchange arrangements (euro means that the euro is used, FF that the currency is pegged to the French franc, and other that the currency of another country is used as legal tender). Exchange rate structures include dual exchange rates (D), multiple exchange rates (M), and unitary rate (U). b. On January 1, 1999 the euro was established as the sole currency of 11 European countries, later joined by Greece in January, 2001. However, the old national currencies, now effectively sub-units of the euro, with irrevocably fixed conversion rates, remained in use until early 2002. The *World Development Indicators* uses the old national currencies and the exchange rates to the U.S. dollar derived from the euro-dollar rate. The average euro-dollar exchange rate in 2000 was 1.085.



About the data

In a market-based economy the choices households, producers, and governments make about the allocation of resources are influenced by relative prices, including the real exchange rate, real wages, real interest rates, and commodity prices. Relative prices also reflect, to a large extent, the choices of these agents. Thus relative prices convey vital information about the interaction of economic agents in an economy and with the rest of the world.

The exchange rate is the price of one currency in terms of another. Official exchange rates and exchange rate arrangements are established by governments (other exchange rates fully recognized by governments include market rates, which are determined largely by legal market forces, and, for countries maintaining multiple exchange arrangements, principal rates, secondary rates, and tertiary rates).

Real effective exchange rates are derived by deflating a trade-weighted average of the nominal exchange rates that apply between trading partners. For most high-income countries the weights are based on trade in manufactured goods with other high-income countries during 1989–91, and an index of relative, normalized unit labor costs is used as the deflator. (Normalization smooths a time series by removing short-term fluctuations while retaining changes of a large amplitude over the longer economic cycle.) For other countries the weights prior to 1990 take into account trade in manufactured and primary products during 1980–82, the weights from January 1990 onward take into account trade during 1988–90, and an index of relative changes in consumer prices is used as the deflator. An increase in the real effective exchange rate represents an appreciation of the local currency. Because of conceptual and data limitations, changes in real effective exchange rates should be interpreted with caution.

The official or market exchange rate is often used to compare prices in different currencies. But because market imperfections are extensive and exchange rates reflect at best the relative prices of tradable goods, the volume of goods and services that a U.S. dollar buys in the United States may not correspond to what a U.S. dollar converted to another country's currency at the official exchange rate would buy in that country. The alternative approach is to convert national currency estimates of gross national income to a common currency by using conversion factors that reflect equivalent purchasing power. Purchasing power parity (PPP) conversion factors are based on price and expenditure surveys conducted by the International Comparison Programme (ICP) and represent the conversion factors applied to equalize price levels across countries. See *About the data* for table 1.1 for further discussion of the PPP conversion factor.

Many interest rates coexist in an economy, reflecting competitive conditions, the terms gov-

erning loans and deposits, and differences in the position and status of creditors and debtors. In some economies interest rates are set by regulation or administrative fiat. In economies with imperfect markets, or where reported nominal rates are not indicative of effective rates, it may be difficult to obtain data on interest rates that reflect actual market transactions. Deposit and lending rates are collected by the International Monetary Fund (IMF) as representative interest rates offered by banks to resident customers. The terms and conditions attached to these rates differ by country, however, limiting their comparability. Real interest rates are calculated by adjusting nominal rates by an estimate of the inflation rate in the economy. A negative real interest rate indicates a loss in the purchasing power of the principal. The real interest rates in the table are calculated as $(i - P)/(1 + P)$, where i is the nominal interest rate and P is the inflation rate (as measured by the GDP deflator).

The table also shows prices for two key agricultural commodities, wheat and maize. The prices received by farmers, used here, are important determinants of the type and volume of agricultural production. In theory these prices should refer to national average farmgate, or first-point-of-sale, transactions. But depending on the country's institutional arrangements—whether it relies on market wholesale prices, government fixed prices, or support prices—the data may not always refer to the same selling points. These data come from the Food and Agriculture Organization (FAO), with most originating from official national publications or FAO questionnaires. As the data show, the prices received by farmers are often not equalized across international markets (even after adjusting for freight, transport, and insurance costs and for differences in quality). Market imperfections such as taxes, subsidies, and trade barriers drive a wedge between domestic and international prices.

Definitions

- **Exchange rate arrangements** describe the arrangement that an IMF member country has furnished to the IMF under article IV, section 2(a) of the IMF's Articles of Agreement. *Exchange rate classification* indicates how the exchange rate is determined in the main market when there is more than one market: floating (managed or independent), pegged (conventional, within horizontal bands, crawling peg, or crawling band), currency board (implicit legislative commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate), and exchange arrangement (country uses the euro, currency is pegged to the French franc, or another country's currency is used as legal tender). *Exchange rate structure* shows whether countries have a unitary exchange rate or dual or multiple rates.
- **Official exchange rate** refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar).
- **Purchasing power parity conversion factor** is the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a U.S. dollar would buy in the United States.
- **Real effective exchange rate** is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.
- **Deposit interest rate** is the rate paid by commercial or similar banks for demand, time, or savings deposits.
- **Lending interest rate** is the rate charged by banks on loans to prime customers.
- **Real interest rate** is the lending interest rate adjusted for inflation as measured by the GDP deflator.
- **Key agricultural producer prices** are domestic producer prices converted to U.S. dollars using the official exchange rate.

Data sources

The information on exchange rate arrangements is from the IMF's *Exchange Arrangements and Exchange Restrictions Annual Report, 2000*. The official and real effective exchange rates and deposit and lending rates are from the IMF's *International Financial Statistics*. PPP conversion factors are from the World Bank. The agricultural price data are from the FAO's *Production Yearbook*. The real interest rates are calculated using World Bank data on the GDP deflator.



5.7 | Defense expenditures and trade in arms

| | Military expenditures | | | | Armed forces personnel | | | | Arms trade | | | |
|--------------------------|-----------------------|------------------|-------------------------------------|------------------|------------------------|-------|------------------|------|----------------------------|------|----------------------------|------|
| | % of GNI | | % of central government expenditure | | Total thousands | | % of labor force | | Exports % of total exports | | Imports % of total imports | |
| | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 |
| Afghanistan | .. | .. | .. | .. | 45 | .. | 0.6 | .. | 0.0 | 0.0 | 0.0 | .. |
| Albania | 4.9 | 1.3 | 10.0 | 4.5 | 65 | 18 | 4.2 | 1.1 | 0.0 | 0.0 | 0.0 | 2.6 |
| Algeria | 1.8 | 4.0 | 5.9 | 12.6 | 126 | 120 | 1.6 | 1.2 | 0.0 | 0.0 | 0.1 | 4.1 |
| Angola | 16.6 | 21.2 | 24.6 | 41.1 | 128 | 100 | 2.7 | 1.7 | 0.0 | 0.0 | 1.5 | 7.3 |
| Argentina | 1.9 | 1.6 | 16.1 | 9.1 | 65 | 73 | 0.5 | 0.5 | 0.0 | 0.0 | 0.3 | 0.4 |
| Armenia | 3.5 | 5.8 | .. | 20.2 | 20 | 50 | 1.1 | 2.6 | 0.0 | 0.0 | 0.0 | 1.3 |
| Australia | 2.4 | 1.8 | 9.3 | 7.6 | 68 | 55 | 0.8 | 0.6 | 0.1 | 1.0 | 2.1 | 1.6 |
| Austria | 0.9 | 0.8 | 2.4 | 1.5 | 44 | 49 | 1.2 | 1.3 | 0.2 | 0.0 | 0.1 | 0.0 |
| Azerbaijan | 5.8 | 6.6 | 18.0 | 24.4 | 43 | 75 | 1.4 | 2.1 | 0.0 | 0.0 | 0.0 | 1.2 |
| Bangladesh | 1.3 | 1.3 | 11.2 | 10.1 | 107 | 110 | 0.2 | 0.2 | 0.0 | 0.0 | 1.1 | 1.0 |
| Belarus | 1.9 | 1.3 | 4.9 | 4.1 | 102 | 65 | 1.9 | 1.2 | 0.0 | 5.2 | 0.0 | 0.0 |
| Belgium | 1.8 | 1.4 | 3.7 | 3.1 | 79 | 42 | 1.9 | 1.0 | 0.3 | 0.0 | 0.2 | 0.2 |
| Benin | 1.3 | 1.4 | 6.3 | 8.3 | 7 | 8 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | 0.8 |
| Bolivia | 2.2 | 1.8 | 10.6 | 8.0 | 32 | 33 | 1.2 | 1.0 | 0.0 | 0.0 | 0.9 | 0.6 |
| Bosnia and Herzegovina | 19.0 | 4.5 | .. | 24.3 | 60 | 30 | .. | 1.7 | 0.0 | 0.0 | 0.0 | 6.2 |
| Botswana | 4.2 | 4.7 | 10.3 | 9.8 | 7 | 8 | 1.2 | 1.1 | 0.0 | 0.0 | 1.1 | 1.8 |
| Brazil | 1.1 | 1.9 | 3.5 | 5.5 | 296 | 300 | 0.4 | 0.4 | 0.5 | 0.0 | 0.9 | 0.3 |
| Bulgaria | 3.3 | 3.0 | 7.9 | 8.7 | 99 | 70 | 2.3 | 1.7 | 3.1 | 5.1 | 0.0 | 0.2 |
| Burkina Faso | 2.4 | 1.6 | 11.5 | 5.9 | 9 | 9 | 0.2 | 0.2 | 0.0 | 0.0 | 1.1 | 0.0 |
| Burundi | 3.6 | 7.0 | 10.5 | 26.7 | 13 | 40 | 0.4 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cambodia | 4.9 | 4.0 | 30.6 | 26.0 | 135 | 60 | 2.7 | 1.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Cameroon | 1.8 | 1.8 | 9.2 | 10.6 | 12 | 15 | 0.2 | 0.3 | 0.0 | 0.0 | 0.0 | 0.4 |
| Canada | 1.8 | 1.4 | 6.2 | 5.9 | 82 | 60 | 0.5 | 0.4 | 0.7 | 0.2 | 0.6 | 0.5 |
| Central African Republic | 2.0 | 2.8 | 8.3 | 15.4 | 4 | 3 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Chad | 3.7 | 2.4 | 17.3 | 12.7 | 38 | 30 | 1.3 | 0.8 | 0.0 | 0.0 | 4.1 | 3.2 |
| Chile | 2.3 | 3.0 | 10.5 | 12.3 | 92 | 88 | 1.8 | 1.4 | 0.0 | 0.1 | 1.0 | 0.7 |
| China | 2.8 | 2.3 | 32.7 | 22.2 | 3,160 | 2,400 | 0.5 | 0.3 | 1.3 | 0.2 | 1.6 | 0.4 |
| Hong Kong, China | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Colombia | 2.4 | 3.2 | 14.7 | 15.9 | 139 | 155 | 0.9 | 0.9 | 0.0 | 0.0 | 1.7 | 0.6 |
| Congo, Dem. Rep. | 3.0 | 14.4 | 16.1 | .. | 45 | 55 | 0.3 | 0.3 | 0.0 | 0.0 | 0.0 | 8.9 |
| Congo, Rep. | 5.7 | 3.5 | 13.5 | 8.4 | 10 | 10 | 1.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Costa Rica | 1.1 | 0.5 | 5.5 | 2.0 | 8 | 10 | 0.6 | 0.7 | 0.0 | 0.0 | 0.2 | 0.0 |
| Côte d'Ivoire | 1.5 | 0.8 | 4.3 | 3.4 | 15 | 15 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Croatia | 7.5 | 3.3 ^a | 19.3 | 9.8 ^a | 103 | 60 | 4.6 | 2.9 | 0.0 | 0.2 | 0.0 | 0.1 |
| Cuba | 2.4 | 1.9 | .. | .. | 175 | 50 | 3.5 | 0.9 | 0.0 | 0.0 | 4.5 | 0.0 |
| Czech Republic | 2.4 | 2.3 | 6.7 | 6.3 | 107 | 54 | 1.9 | 0.9 | 1.5 | 0.3 | 0.0 | 0.7 |
| Denmark | 2.0 | 1.6 | 4.8 | 4.2 | 28 | 27 | 1.0 | 0.9 | 0.0 | 0.0 | 0.5 | 0.7 |
| Dominican Republic | 0.9 | 0.7 | 6.3 | 4.4 | 22 | 30 | 0.7 | 0.8 | 0.0 | 0.0 | 0.2 | 0.3 |
| Ecuador | 3.5 | 3.7 | 20.6 | 16.2 | 57 | 58 | 1.5 | 1.2 | 0.0 | 0.0 | 1.2 | 0.7 |
| Egypt, Arab Rep. | 3.5 | 2.7 | 8.5 | 9.3 | 424 | 430 | 2.2 | 1.8 | 0.7 | 0.0 | 19.2 | 4.4 |
| El Salvador | 2.1 | 0.9 | 16.8 | 8.8 | 49 | 15 | 2.4 | 0.6 | 0.0 | 0.0 | 4.1 | 0.3 |
| Eritrea | 17.3 | 27.4 | 34.6 | 51.1 | 55 | 215 | 3.2 | 10.8 | 0.0 | .. | 0.0 | 33.5 |
| Estonia | 0.5 | 1.5 | 2.2 | 4.5 | 3 | 7 | 0.4 | 0.9 | 0.0 | 0.0 | 1.2 | 0.2 |
| Ethiopia | 3.7 | 8.8 | 20.0 | 29.1 | 120 | 300 | 0.5 | 1.1 | 0.0 | 0.0 | 0.0 | 20.5 |
| Finland | 2.2 | 1.4 | 4.3 | 4.5 | 33 | 35 | 1.3 | 1.3 | 0.0 | 0.1 | 2.1 | 1.3 |
| France | 3.4 | 2.7 | 7.6 | 5.9 | 522 | 421 | 2.1 | 1.6 | 0.9 | 1.0 | 0.2 | 0.3 |
| Gabon | 3.1 | 2.4 | 10.1 | 7.3 | 7 | 7 | 1.5 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Gambia, The | 1.0 | 1.3 | 5.6 | 5.4 | 1 | 1 | 0.2 | 0.2 | 0.0 | 0.0 | 2.3 | 0.0 |
| Georgia | 2.7 | 1.2 | .. | 7.0 | 25 | 14 | 0.9 | 0.6 | 0.0 | 6.2 | 0.0 | 1.0 |
| Germany | 2.1 | 1.6 | 6.2 | 4.7 | 442 | 331 | 1.1 | 0.8 | 0.3 | 0.3 | 0.6 | 0.3 |
| Ghana | 0.8 | 0.8 | 4.6 | 3.1 | 7 | 7 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Greece | 4.2 | 4.7 | 15.5 | 16.4 | 208 | 204 | 4.8 | 4.5 | 0.2 | 0.9 | 3.9 | 7.5 |
| Guatemala | 1.5 | 0.7 | 14.0 | 5.0 | 44 | 30 | 1.4 | 0.7 | 0.0 | 0.0 | 0.2 | 0.0 |
| Guinea | 1.4 | 1.6 | 7.0 | 7.4 | 15 | 12 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Guinea-Bissau | 3.2 | 2.7 | 7.6 | 6.1 | 11 | 7 | 2.3 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Haiti | 1.4 | .. | 14.7 | .. | 8 | 0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Honduras | 1.4 | 0.7 | 5.5 | 2.6 | 17 | 8 | 0.9 | 0.3 | 0.0 | 0.0 | 2.9 | 0.4 |



| | Military expenditures | | | | Armed forces personnel | | | | Arms trade | | | |
|--------------------|-----------------------|------|-------------------------------------|------|------------------------|-------|------------------|------|----------------------------|------|----------------------------|------|
| | % of GNI | | % of central government expenditure | | Total thousands | | % of labor force | | Exports % of total exports | | Imports % of total imports | |
| | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 |
| Hungary | 2.1 | 1.7 | 3.9 | 3.9 | 78 | 51 | 1.6 | 1.1 | 0.4 | 0.0 | 0.0 | 0.3 |
| India | 2.4 | 2.5 | 12.4 | 14.6 | 1,270 | 1,300 | 0.3 | 0.3 | 0.0 | 0.0 | 2.9 | 1.6 |
| Indonesia | 1.4 | 1.1 | 7.2 | 5.3 | 283 | 296 | 0.3 | 0.3 | 0.1 | 0.2 | 0.4 | 1.9 |
| Iran, Islamic Rep. | 3.0 | 2.9 | 14.9 | 11.2 | 528 | 460 | 3.2 | 2.4 | 0.1 | 0.1 | 3.3 | 0.9 |
| Iraq | 8.3 | 5.5 | .. | .. | 407 | 420 | 8.2 | 6.7 | 0.0 | 0.0 | 0.0 | 0.1 |
| Ireland | 1.4 | 1.0 | 3.2 | 2.6 | 13 | 14 | 1.0 | 0.9 | 0.0 | 0.0 | 0.1 | 0.1 |
| Israel | 11.7 | 8.8 | 23.3 | 18.5 | 181 | 173 | 8.8 | 6.6 | 6.2 | 2.3 | 10.3 | 7.2 |
| Italy | 2.1 | 2.0 | 3.9 | 4.7 | 471 | 391 | 1.9 | 1.5 | 0.3 | 0.2 | 0.2 | 0.3 |
| Jamaica | 1.0 | 0.8 | 3.0 | 2.1 | 3 | 3 | 0.2 | 0.2 | 0.0 | 0.0 | 0.6 | 0.3 |
| Japan | 1.0 | 1.0 | 4.5 | 6.1 | 242 | 240 | 0.4 | 0.4 | 0.0 | 0.0 | 0.9 | 1.0 |
| Jordan | 8.5 | 9.2 | 27.3 | 27.5 | 100 | 102 | 9.8 | 7.3 | 0.0 | 0.0 | 1.2 | 1.9 |
| Kazakhstan | 2.9 | 0.9 | 14.2 | 5.3 | 15 | 33 | 0.2 | 0.5 | 0.0 | 0.2 | 0.0 | 4.3 |
| Kenya | 3.0 | 1.9 | 11.5 | 7.1 | 24 | 24 | 0.2 | 0.2 | 0.0 | 0.0 | 1.1 | 0.2 |
| Korea, Dem. Rep. | 25.0 | 18.8 | 28.5 | .. | 1,200 | 1,000 | 11.3 | 8.6 | 13.1 | 22.4 | 7.9 | 2.5 |
| Korea, Rep. | 3.6 | 2.9 | 19.8 | 11.0 | 750 | 665 | 3.6 | 2.8 | 0.1 | 0.0 | 1.5 | 1.8 |
| Kuwait | 77.0 | 7.7 | 96.3 | 20.8 | 12 | 21 | 2.1 | 2.7 | 0.2 | 0.0 | 13.8 | 9.5 |
| Kyrgyz Republic | 0.7 | 2.4 | 3.2 | 14.0 | 12 | 12 | 0.6 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lao PDR | 9.0 | 2.0 | 21.6 | 11.1 | 37 | 50 | 1.7 | 2.0 | 0.0 | 0.0 | 3.7 | 0.0 |
| Latvia | 1.6 | 0.9 | 4.3 | 2.5 | 5 | 5 | 0.3 | 0.4 | 0.0 | 0.0 | 0.0 | 0.2 |
| Lebanon | 4.0 | 4.0 | 18.5 | 11.0 | 37 | 58 | 3.1 | 3.9 | 0.0 | 0.0 | 0.0 | 0.2 |
| Lesotho | 3.1 | 2.6 | 10.5 | 6.5 | 2 | 2 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Liberia | .. | 1.2 | .. | 8.3 | 2 | .. | 0.2 | .. | 0.0 | 0.0 | 0.0 | 0.0 |
| Libya | 7.6 | .. | 16.4 | .. | 85 | 85 | 6.6 | 5.8 | 0.1 | 0.8 | 1.7 | 0.2 |
| Lithuania | 0.7 | 1.3 | 2.5 | 3.9 | 10 | 12 | 0.5 | 0.6 | 0.0 | 0.0 | 0.0 | 0.4 |
| Macedonia, FYR | 2.0 | 2.5 | .. | 10.4 | 10 | 16 | 1.1 | 1.7 | 0.0 | 0.0 | 0.0 | 1.1 |
| Madagascar | 1.1 | 1.2 | 5.4 | 7.4 | 21 | 20 | 0.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Malawi | 1.1 | 0.6 | 3.9 | 2.2 | 10 | 5 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Malaysia | 3.2 | 2.3 | 10.3 | 9.3 | 128 | 95 | 1.7 | 1.0 | 0.0 | 0.0 | 0.6 | 1.4 |
| Mali | 2.3 | 2.3 | 9.4 | 8.7 | 12 | 10 | 0.3 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mauritania | 3.5 | 4.0 | 13.3 | 18.9 | 16 | 11 | 1.7 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mauritius | 0.4 | 0.2 | 1.5 | 0.9 | 1 | 2 | 0.2 | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 |
| Mexico | 0.5 | 0.6 | 4.6 | 3.8 | 175 | 255 | 0.5 | 0.6 | 0.0 | 0.0 | 0.5 | 0.1 |
| Moldova | 0.5 | 0.5 | 1.5 | 1.6 | 9 | 11 | 0.4 | 0.5 | 0.0 | 2.1 | 0.8 | 0.0 |
| Mongolia | 2.6 | 2.1 | 9.3 | 5.9 | 21 | 20 | 2.1 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Morocco | 4.5 | 4.3 | 14.3 | 13.5 | 195 | 195 | 2.1 | 1.7 | 0.0 | 0.0 | 1.4 | 1.3 |
| Mozambique | 6.0 | 2.5 | 17.0 | 9.1 | 50 | 8 | 0.6 | 0.1 | 0.0 | 0.0 | 0.6 | 0.4 |
| Myanmar | 8.3 | 7.8 | 74.3 | .. | 286 | 345 | 1.3 | 1.4 | 0.0 | 0.0 | 23.0 | 13.6 |
| Namibia | 2.3 | 2.9 | 5.6 | 7.2 | 8 | 3 | 1.3 | 0.4 | 0.0 | 0.0 | 0.0 | 1.3 |
| Nepal | 1.0 | 0.8 | 6.0 | 5.7 | 35 | 35 | 0.4 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Netherlands | 2.3 | 1.8 | 4.6 | 5.9 | 90 | 54 | 1.3 | 0.7 | 0.1 | 0.1 | 0.4 | 0.4 |
| New Zealand | 1.6 | 1.2 | 4.0 | 3.5 | 11 | 10 | 0.6 | 0.5 | 0.0 | 0.0 | 1.2 | 4.0 |
| Nicaragua | 3.1 | 1.2 | 7.6 | 2.9 | 15 | 12 | 1.0 | 0.6 | 13.5 | 0.0 | 0.6 | 0.0 |
| Niger | 1.3 | 1.2 | 7.9 | 6.4 | 5 | 6 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Nigeria | 1.1 | 1.6 | 6.5 | 8.1 | 76 | 77 | 0.2 | 0.2 | 0.0 | 0.0 | 1.9 | 0.0 |
| Norway | 3.1 | 2.2 | 6.4 | 5.0 | 36 | 33 | 1.7 | 1.4 | 0.1 | 0.0 | 1.7 | 1.4 |
| Oman | 20.5 | 15.3 | 40.2 | 36.3 | 35 | 38 | 6.7 | 6.1 | 0.0 | 0.0 | 0.3 | 0.6 |
| Pakistan | 7.0 | 5.9 | 27.9 | 27.9 | 580 | 590 | 1.4 | 1.2 | 0.4 | 0.1 | 6.6 | 9.7 |
| Panama | 1.3 | 1.4 | 5.7 | 5.1 | 11 | 13 | 1.1 | 1.1 | 2.0 | 0.0 | 0.5 | 0.1 |
| Papua New Guinea | 1.4 | 1.1 | 4.2 | 3.7 | 4 | 4 | 0.2 | 0.2 | 0.0 | 0.0 | 4.0 | 0.0 |
| Paraguay | 1.8 | 1.1 | 13.2 | 3.9 | 16 | 17 | 1.0 | 0.8 | 0.0 | 0.0 | 0.7 | 0.6 |
| Peru | 2.2 | 2.4 | 11.1 | 12.3 | 112 | 115 | 1.4 | 1.2 | 0.0 | 0.0 | 1.4 | 0.4 |
| Philippines | 1.9 | 1.4 | 10.2 | 7.3 | 107 | 107 | 0.4 | 0.3 | 0.0 | 0.0 | 1.8 | 0.3 |
| Poland | 2.3 | 2.1 | 5.5 | 6.1 | 270 | 187 | 1.4 | 0.9 | 0.2 | 0.1 | 0.0 | 0.1 |
| Portugal | 2.6 | 2.1 | 6.4 | 5.4 | 80 | 71 | 1.6 | 1.4 | 0.1 | 0.0 | 0.6 | 0.2 |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | 3.3 | 1.6 | 7.9 | 4.7 | 172 | 170 | 1.6 | 1.6 | 0.5 | 0.5 | 0.6 | 1.9 |
| Russian Federation | 8.0 | 5.6 | 28.0 | 22.4 | 1,900 | 900 | 2.5 | 1.2 | 5.8 | 4.2 | 0.0 | 1.1 |



5.7 | Defense expenditures and trade in arms

| | Military expenditures | | | | Armed forces personnel | | | | Arms trade | | | |
|--------------------------------|-----------------------|--------------|-------------------------------------|---------------|------------------------|-----------------|------------------|--------------|----------------------------|--------------|----------------------------|--------------|
| | % of GNI | | % of central government expenditure | | Total thousands | | % of labor force | | Exports % of total exports | | Imports % of total imports | |
| | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 | 1992 | 1999 |
| Rwanda | 4.4 | 4.5 | 21.7 | 22.7 | 30 | 40 | 0.8 | 0.9 | 0.0 | 0.0 | 0.0 | 11.9 |
| Saudi Arabia | 27.2 | 14.9 | 72.5 | 43.2 | 172 | 190 | 3.1 | 2.9 | 0.0 | 0.0 | 25.2 | 27.5 |
| Senegal | 2.8 | 1.7 | 13.5 | 8.2 | 18 | 13 | 0.5 | 0.3 | 0.0 | 0.0 | 1.0 | 0.0 |
| Sierra Leone | 3.5 | 3.0 | 17.7 | 13.5 | 8 | 3 | 0.5 | 0.2 | 0.0 | 0.0 | 6.8 | 12.3 |
| Singapore | 5.2 | 4.8 | 26.1 | 20.5 | 56 | 60 | 3.4 | 3.0 | 0.0 | 0.0 | 0.4 | 0.9 |
| Slovak Republic | 2.1 | 1.8 | 5.1 | 4.4 | 33 | 36 | 1.2 | 1.2 | 0.7 | 0.1 | 3.5 | 0.2 |
| Slovenia | 2.4 | 1.4 | 6.0 | 3.4 | 15 | 10 | 1.5 | 1.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| Somalia | .. | .. | .. | .. | .. | .. | .. | .. | 0.0 | 0.0 | 0.0 | 0.0 |
| South Africa | 3.0 | 1.5 | 8.9 | 5.0 | 75 | 68 | 0.5 | 0.4 | 0.4 | 0.1 | 1.3 | 0.2 |
| Spain | 1.5 | 1.3 | 4.3 | 6.1 | 198 | 155 | 1.2 | 0.9 | 0.3 | 0.1 | 0.4 | 0.5 |
| Sri Lanka | 3.7 | 4.7 | 13.2 | 18.4 | 110 | 110 | 1.5 | 1.3 | 0.0 | 0.0 | 0.3 | 0.7 |
| Sudan | 9.8 | 4.8 | 64.0 | 46.8 | 82 | 105 | 0.8 | 0.9 | 0.0 | 0.0 | 13.4 | 0.7 |
| Swaziland | 1.9 | 1.5 | 6.3 | 4.6 | 3 | 3 | 1.1 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Sweden | 2.5 | 2.3 | 5.3 | 5.5 | 70 | 52 | 1.5 | 1.1 | 1.5 | 0.8 | 0.3 | 0.3 |
| Switzerland | 1.8 | 1.2 | 7.2 | 5.1 | 31 | 39 | 0.8 | 1.0 | 1.2 | 0.1 | 0.7 | 1.5 |
| Syrian Arab Republic | 9.2 | 7.0 | 39.0 | 25.1 | 408 | 310 | 11.0 | 6.2 | 0.6 | 0.0 | 11.2 | 5.5 |
| Tajikistan | 0.3 | 1.3 | 0.7 | 9.4 | 3 | 7 | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tanzania | 2.0 | 1.4 | 10.0 | 10.1 | 46 | 35 | 0.3 | 0.2 | 0.0 | 0.0 | 0.3 | 0.3 |
| Thailand | 2.6 | 1.7 | 17.0 | 6.1 | 283 | 300 | 0.9 | 0.8 | 0.0 | 0.0 | 1.2 | 0.7 |
| Togo | 2.9 | 1.8 | 13.2 | 9.4 | 8 | 11 | 0.5 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Trinidad and Tobago | 1.5 | 1.4 | 4.8 | 5.5 | 2 | 2 | 0.4 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Tunisia | 2.4 | 1.8 | 7.1 | 5.4 | 35 | 35 | 1.1 | 0.9 | 0.0 | 0.0 | 0.3 | 0.1 |
| Turkey | 3.8 | 5.3 | 18.8 | 13.9 | 704 | 789 | 2.7 | 2.6 | 0.1 | 0.3 | 6.6 | 7.9 |
| Turkmenistan | .. | 3.4 | .. | 16.0 | 28 | 15 | 1.7 | 0.7 | 1.4 | 0.0 | 0.0 | 1.0 |
| Uganda | 2.4 | 2.3 | 11.7 | 13.9 | 70 | 50 | 0.8 | 0.5 | 0.0 | 0.0 | 2.0 | 2.2 |
| Ukraine | 1.9 | 3.0 | .. | 8.2 | 430 | 340 | 1.6 | 1.3 | 0.0 | 4.7 | 0.0 | 0.1 |
| United Arab Emirates | 5.6 | 4.1 | 50.1 | 39.6 | 55 | 65 | 5.2 | 4.7 | 0.0 | 0.0 | 4.2 | 3.8 |
| United Kingdom | 3.8 | 2.5 | 9.1 | 6.9 | 293 | 218 | 1.0 | 0.7 | 3.3 | 1.9 | 1.3 | 0.8 |
| United States | 4.8 | 3.0 | 21.1 | 15.7 | 1,920 | 1,490 | 1.5 | 1.0 | 5.6 | 4.7 | 0.3 | 0.2 |
| Uruguay | 2.1 | 1.3 | 8.0 | 4.1 | 25 | 24 | 1.8 | 1.6 | 0.0 | 0.0 | 0.5 | 0.3 |
| Uzbekistan | 2.7 | 1.7 | 6.0 | 5.3 | 40 | 60 | 0.5 | 0.6 | 0.0 | 0.4 | 0.0 | 0.0 |
| Venezuela, RB | 1.4 | 1.4 | 6.3 | 7.1 | 75 | 75 | 1.0 | 0.8 | 0.0 | 0.0 | 0.9 | 2.2 |
| Vietnam | 3.4 | 2.5 | 14.5 | 11.6 | 857 | 485 | 2.4 | 1.2 | 0.4 | 0.0 | 0.4 | 0.6 |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | 9.8 | 6.1 | 29.8 | 18.0 | 64 | 69 | 1.5 | 1.3 | 0.0 | 0.0 | 0.2 | 1.5 |
| Yugoslavia, Fed. Rep. | .. | 5.0 | .. | .. | 137 | 105 | 2.8 | 2.1 | 0.0 | .. | 0.0 | .. |
| Zambia | 3.3 | 1.0 | 9.3 | 3.5 | 16 | 17 | 0.5 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Zimbabwe | 3.8 | 5.0 | 10.1 | 12.1 | 48 | 40 | 1.0 | 0.7 | 0.3 | 0.0 | 4.1 | 0.5 |
| World | 3.2 w | 2.3 w | 12.2 w | 10.0 w | 24,533 t | 21,198 t | 0.9 w | 0.7 w | 1.2 w | 1.0 w | 1.1 w | 0.9 w |
| Low income | 2.6 | 2.5 | 11.8 | 13.8 | 6,485 | 6,254 | 0.7 | 0.6 | 0.1 | 0.5 | 2.0 | 1.9 |
| Middle income | 4.0 | 2.7 | 21.1 | 15.8 | 12,383 | 10,220 | 1.0 | 0.7 | 0.8 | 0.4 | 2.8 | 1.7 |
| Lower middle income | 4.3 | 2.7 | 23.7 | 17.2 | 9,172 | 6,971 | 0.9 | 0.6 | 1.7 | 0.9 | 2.1 | 0.8 |
| Upper middle income | 3.8 | 2.8 | 19.3 | 12.3 | 3,211 | 3,249 | 1.4 | 1.2 | 0.1 | 0.0 | 3.3 | 2.2 |
| Low & middle income | 3.7 | 2.7 | 19.7 | 15.4 | 18,868 | 16,474 | 0.9 | 0.7 | 0.7 | 0.4 | 2.6 | 1.7 |
| East Asia & Pacific | 2.8 | 2.3 | 22.8 | 16.8 | 7,256 | 5,831 | 0.8 | 0.6 | 0.4 | 0.1 | 1.3 | 1.0 |
| Europe & Central Asia | 5.2 | 3.7 | 21.6 | 11.7 | 4,303 | 3,192 | 2.0 | 1.3 | 2.9 | 1.8 | 1.4 | 1.7 |
| Latin America & Carib. | 1.3 | 1.5 | 5.7 | 7.3 | 1,443 | 1,371 | 0.8 | 0.6 | 0.2 | 0.0 | 0.7 | 0.3 |
| Middle East & N. Africa | 14.5 | 7.0 | 49.0 | 28.5 | 2,631 | 2,529 | 3.3 | 2.6 | 0.1 | 0.1 | 10.7 | 8.4 |
| South Asia | 3.0 | 2.8 | 14.9 | 15.7 | 2,152 | 2,153 | 0.4 | 0.4 | 0.1 | 0.0 | 3.3 | 2.4 |
| Sub-Saharan Africa | 2.9 | 2.2 | 9.1 | 8.9 | 1,083 | 1,398 | 0.5 | 0.5 | 0.2 | 0.1 | 1.3 | 1.4 |
| High income | 3.1 | 2.3 | 11.1 | 9.1 | 5,665 | 4,724 | 1.3 | 1.0 | 1.4 | 1.2 | 0.7 | 0.6 |
| Europe EMU | 2.3 | 1.9 | 5.7 | 5.2 | 2,181 | 1,768 | 1.6 | 1.3 | 0.4 | 0.3 | 0.4 | 0.4 |

Note: Data for some countries are based on partial or uncertain data or rough estimates; see U.S. Department of State (2002).

a. Data from national source.



About the data

Although national defense is an important function of government and security from external threats contributes to economic development, high levels of defense spending burden the economy and may impede growth. Comparisons of defense spending between countries should take into account the many factors that influence perceptions of vulnerability and risk, including historical and cultural traditions, the length of borders that need defending, the quality of relations with neighbors, and the role of the armed forces in the body politic.

Data on defense spending from governments are often incomplete and unreliable. Even in countries where parliaments vigilantly review government budgets and spending, defense spending and trade in arms often do not receive close scrutiny. For a detailed critique of the quality of such data see Ball (1984) and Happe and Wakeman-Linn (1994).

The International Monetary Fund's (IMF) *Government Finance Statistics Yearbook* is the primary source of data on defense spending. It uses a consistent definition of defense spending based on the United Nations' classification of the functions of government and the North Atlantic Treaty Organization (NATO) definition. The IMF checks data on defense spending for broad consistency with other macroeconomic data reported to it but is not always able to verify the accuracy and completeness of the data. Moreover, country coverage is affected by delays or failure to report data. Thus most researchers supplement the IMF's data with assessments by other organizations. However, these organizations rely heavily on reporting by governments, on confidential intelligence estimates of varying quality, on sources that they do not or cannot reveal, and on one another's publications. The data in this table are the latest available from the U.S. Department of State's Bureau of Verification and Compliance (formerly the Bureau of Arms Control).

Definitions of military spending differ depending on whether they cover civil defense, reserves and auxiliary forces, police and paramilitary forces, dual-purpose forces such as military and civilian police, military grants in kind, pensions for military personnel, and social security contributions paid by one part of government to another. Official government data may omit parts of military spending, disguise financing through extrabudgetary accounts or unrecorded use of foreign exchange receipts, or fail to include military assistance or secret military equipment imports. Current spending is more likely to be reported than capital spending. In some cases a more accurate estimate of military spending can be obtained by adding the value of estimated arms imports and nominal military expenditures. This method may understate or overstate spending in a particular year, however, because payments for arms may not coincide with deliveries.

The data on armed forces refer to military personnel on active duty, including paramilitary forces. These data exclude civilians in the defense establishment and so are not consistent with the data on military spending on personnel. Moreover, because they exclude payments to personnel not on active duty, they underestimate the share of the labor force working for the defense establishment. Because governments rarely report the size of their armed forces, such data typically come from intelligence sources. The Bureau of Verification and Compliance attributes its data to unspecified U.S. government sources.

The Standard International Trade Classification does not clearly distinguish trade in military goods. For this and other reasons, customs-based data on trade in arms are of little use, so most compilers rely on trade publications, confidential government information on third-country trade, and other sources. The construction of defense production facilities and the licensing fees paid for the production of arms are included in trade data when they are specified in military transfer agreements. Grants in kind are usually included as well. Definitional issues include treatment of dual-use equipment such as aircraft, use of military establishments such as schools and hospitals by civilians, and purchases by nongovernmental buyers. Bureau of Verification and Compliance data do not include arms supplied to subnational groups. Valuation problems arise when data are reported in volume terms and the purchase price must be estimated. Differences between sources may reflect reporting lags or differences in the period covered. Most compilers revise their time-series data regularly, so estimates for the same year may not be consistent between publication dates.

The data on U.S. arms exports were substantially revised upward in the 2000 edition of the *World Development Indicators*, based on data from the most recent edition of the Bureau of Verification and Compliance's *World Military Expenditures and Arms Transfers* (U.S. Department of State 1999). Revisions were made in commercial arms sales made directly by U.S. firms to foreign importers under authorization of the U.S. Department of State in accordance with U.S. regulations on international traffic in arms. Under the previous methodology the commercial arms component was represented by preliminary data on the deliveries made under approved export licenses. But because of weaknesses in data reporting, the extent to which authorized exports matched actual exports was uncertain. The new methodology assumes that deliveries constitute 50 percent of total authorizations by country. These deliveries are then distributed in a fixed pattern over the years of the license.

Definitions

- **Military expenditures** for NATO countries are based on the NATO definition, which covers military-related expenditures of the defense ministry (including recruiting, training, construction, and the purchase of military supplies and equipment) and other ministries. Civilian-type expenditures of the defense ministry are excluded. Military assistance is included in the expenditures of the donor country, and purchases of military equipment on credit are included at the time the debt is incurred, not at the time of payment. Data for other countries generally cover expenditures of the ministry of defense (excluded are expenditures on public order and safety, which are classified separately).
- **Armed forces personnel** refer to active duty military personnel, including paramilitary forces if those forces resemble regular units in their organization, equipment, training, or mission.
- **Arms trade** comprises exports and imports of military equipment usually referred to as "conventional," including weapons of war, parts thereof, ammunition, support equipment, and other commodities designed for military use. See *About the data* for more details.

Data sources

The data on military expenditures, armed forces, and arms trade are from the Bureau of Verification and Compliance's *World Military Expenditures and Arms Transfers 2000* (U.S. Department of State 2002).



5.8 | Transport infrastructure

| | Roads | | | Railways | | | Air | | |
|--------------------------|-------------------------------------------------|-----------------------------------------|-------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------|--------------------------------------|-------------------------------------|
| | Total road network km 1995-2000 ^a | Paved roads % 1995-2000 ^a | Goods hauled million ton-km 1995-2000 ^a | Passenger-km per \$ million of PPP GDP 1995-2000 ^a | Goods transported ton-km per \$ million of PPP GDP 1995-2000 ^a | Diesel locomotives available (%) 1995-2000 ^a | Aircraft departures thousands 2000 | Passengers carried thousands 2000 | Air freight millions ton-km 2000 |
| Afghanistan | 21,000 | 13.3 | .. | .. | .. | .. | 3 | 150 | 8 |
| Albania | 18,000 | 39.0 | 1,830 | 9,196 | 1,941 | .. | 5 | 149 | 0 |
| Algeria | 104,000 | 68.9 | .. | 11,146 | .. | 85 | 37 | 2,995 | 12 |
| Angola | 51,429 | 10.4 | .. | .. | .. | .. | 4 | 235 | 61 |
| Argentina | 215,471 | 29.4 | .. | 28,665 | .. | .. | 196 | 9,262 | 295 |
| Armenia | 15,918 | 96.3 | 40 | 6,232 | 49,717 | 30 | 4 | 298 | 9 |
| Australia | 811,603 | 38.7 | .. | .. | .. | .. | 351 | 32,223 | 1,860 |
| Austria | 200,000 | 100.0 | 16,100 | 41,307 | 75,075 | 89 | 148 | 7,263 | 444 |
| Azerbaijan | 24,981 | 92.3 | 3,513 | .. | .. | .. | 8 | 546 | 47 |
| Bangladesh | 207,486 | 9.5 | .. | 22,570 | 4,706 | 81 | 6 | 1,331 | 194 |
| Belarus | 74,385 | 89.0 | 8,982 | 202,576 | 463,691 | 93 | 6 | 211 | 2 |
| Belgium | 148,216 | 78.2 | 35,000 | 32,012 | 30,522 | 86 | 226 | 10,738 | 1,016 |
| Benin | 6,787 | 20.0 | .. | .. | .. | .. | 2 | 77 | 12 |
| Bolivia | 53,790 | 6.5 | .. | 6,460 | .. | .. | 22 | 1,757 | 15 |
| Bosnia and Herzegovina | 21,846 | 52.3 | .. | .. | .. | .. | 5 | 69 | 1 |
| Botswana | 10,217 | 55.0 | .. | .. | .. | .. | 7 | 166 | 0 |
| Brazil | 1,724,929 | 5.5 | .. | 865 | 31,150 | .. | 723 | 31,845 | 1,523 |
| Bulgaria | 37,286 | 94.0 | 168 | 96,104 | 122,533 | 37 | 12 | 515 | 6 |
| Burkina Faso | 12,506 | 16.0 | .. | .. | .. | .. | 3 | 144 | 12 |
| Burundi | 14,480 | 7.1 | .. | .. | .. | .. | 1 | 12 | 0 |
| Cambodia | 12,323 | 16.2 | 412 | .. | 77,235 | .. | .. | .. | .. |
| Cameroon | 34,300 | 12.5 | .. | 14,371 | 40,811 | 71 | 6 | 273 | 50 |
| Canada | 901,903 | 35.3 | 82,500 | 1,945 | 429,555 | .. | 316 | 25,778 | 1,806 |
| Central African Republic | 23,810 | 2.7 | 60 | .. | .. | .. | 2 | 77 | 12 |
| Chad | 33,400 | 0.8 | .. | .. | .. | .. | 2 | 77 | 12 |
| Chile | 79,814 | 19.4 | .. | 4,907 | 7,802 | 65 | 88 | 5,175 | 1,312 |
| China | 1,402,698 | 22.4 | 612,940 | 82,693 | 260,427 | 82 | 573 | 61,892 | 3,900 |
| Hong Kong, China | 1,831 | 100.0 | .. | .. | .. | .. | 78 | 14,393 | 4,841 |
| Colombia | 112,988 | 14.4 | 31 | 62 | 1,948 | 32 | 197 | 8,537 | 595 |
| Congo, Dem. Rep. | 157,000 | .. | .. | 700 | .. | 9 | .. | .. | .. |
| Congo, Rep. | 12,800 | 9.7 | .. | 36,264 | .. | 35 | 6 | 128 | 12 |
| Costa Rica | 35,892 | 22.0 | 3,070 | .. | .. | 50 | 27 | 861 | 79 |
| Côte d'Ivoire | 50,400 | 9.7 | .. | 6,512 | 21,081 | 53 | 7 | 262 | 12 |
| Croatia | 28,123 | 84.6 | 1,090 | 34,782 | 58,859 | 63 | 17 | 929 | 3 |
| Cuba | 60,858 | 49.0 | .. | .. | .. | 56 | 12 | 1,007 | 49 |
| Czech Republic | 55,408 | 100.0 | 39,036 | 53,029 | 138,506 | 86 | 40 | 2,228 | 32 |
| Denmark | 71,591 | 100.0 | 11,696 | 40,275 | 11,786 | .. | 152 | 5,923 | 199 |
| Dominican Republic | 12,600 | 49.4 | .. | .. | .. | .. | 0 | 11 | 0 |
| Ecuador | 43,197 | 18.9 | 4,176 | .. | .. | .. | 17 | 1,181 | 15 |
| Egypt, Arab Rep. | 64,000 | 78.1 | 31,500 | 317,220 | 16,164 | 80 | 47 | 4,522 | 278 |
| El Salvador | 10,029 | 19.8 | .. | .. | .. | .. | 37 | 1,960 | 31 |
| Eritrea | 4,010 | 21.8 | .. | .. | .. | .. | .. | .. | .. |
| Estonia | 51,411 | 20.1 | 3,689 | 19,842 | 486,631 | 80 | 9 | 278 | 1 |
| Ethiopia | 31,571 | 12.0 | 0 | .. | .. | .. | 27 | 945 | 78 |
| Finland | 77,900 | 64.5 | 26,500 | 29,933 | 87,619 | 89 | 125 | 6,416 | 266 |
| France | 894,000 | 100.0 | 245,400 | 50,392 | 42,145 | 93 | 789 | 51,927 | 5,227 |
| Gabon | 8,464 | 9.9 | .. | 11,254 | 65,276 | 89 | 8 | 442 | 55 |
| Gambia, The | 2,700 | 35.4 | .. | .. | .. | .. | .. | .. | .. |
| Georgia | 20,362 | 93.5 | 475 | 44,361 | 200,857 | 34 | 2 | 118 | 2 |
| Germany | 230,735 | 99.1 | 226,982 | 31,471 | 38,962 | 92 | 743 | 59,362 | 7,128 |
| Ghana | 39,409 | 29.6 | .. | 6,221 | .. | .. | 5 | 314 | 40 |
| Greece | 117,000 | 91.8 | 17,000 | 11,850 | 2,101 | 55 | 99 | 7,099 | 129 |
| Guatemala | 14,118 | 34.5 | .. | .. | .. | .. | 7 | 506 | 3 |
| Guinea | 30,500 | 16.5 | .. | .. | .. | .. | 1 | 61 | 1 |
| Guinea-Bissau | 4,400 | 10.3 | .. | .. | .. | .. | 1 | 20 | 0 |
| Haiti | 4,160 | 24.3 | .. | .. | .. | .. | .. | .. | .. |
| Honduras | 13,603 | 20.4 | .. | .. | .. | .. | .. | .. | .. |



| | Roads | | | Railways | | | Air | | |
|--------------------|------------------------|------------------------|-----------------------------|----------------------------------------|----------------------------------------------------|----------------------------------|-------------------------------|------------------------------|-----------------------------|
| | Total road network km | Paved roads % | Goods hauled million ton-km | Passenger-km per \$ million of PPP GDP | Goods transported ton-km per \$ million of PPP GDP | Diesel locomotives available (%) | Aircraft departures thousands | Passengers carried thousands | Air freight millions ton-km |
| | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 2000 | 2000 | 2000 |
| Hungary | 188,203 | 43.4 | 14 | 94,085 | 72,243 | 79 | 32 | 2,062 | 51 |
| India | 3,319,644 | 45.7 | 958 | 195,355 | 136,165 | 86 | 199 | 17,339 | 545 |
| Indonesia | 342,700 | 46.3 | .. | 28,490 | 8,725 | 83 | 153 | 9,485 | 423 |
| Iran, Islamic Rep. | 167,157 | 56.3 | .. | 18,506 | 43,629 | 47 | 83 | 8,830 | 71 |
| Iraq | 45,550 | 84.3 | .. | .. | .. | .. | .. | .. | 0 |
| Ireland | 92,500 | 94.1 | 5,900 | 18,714 | 4,599 | 74 | 146 | 14,014 | 168 |
| Israel | 16,281 | 100.0 | .. | 3,243 | 9,132 | 92 | 45 | 4,073 | 886 |
| Italy | 479,688 | 100.0 | 219,800 | 38,135 | 18,054 | 79 | 375 | 30,586 | 1,748 |
| Jamaica | 18,700 | 70.1 | .. | .. | .. | .. | 24 | 1,918 | 48 |
| Japan | 1,161,894 | 46.0 | 307,149 | 77,409 | 7,608 | 81 | 642 | 108,413 | 8,549 |
| Jordan | 7,245 | 100.0 | .. | .. | 35,549 | 91 | 16 | 1,282 | 204 |
| Kazakhstan | 81,331 | 94.7 | 4,506 | 177,393 | 1,474,814 | .. | 8 | 461 | 12 |
| Kenya | 63,942 | 12.1 | .. | 13,457 | 44,821 | 64 | 29 | 1,557 | 77 |
| Korea, Dem. Rep. | 31,200 | 6.4 | .. | .. | .. | .. | 1 | 86 | 2 |
| Korea, Rep. | 86,990 | 74.5 | 74,504 | 46,461 | 19,459 | 90 | 227 | 34,331 | 7,774 |
| Kuwait | 4,450 | 80.6 | .. | .. | .. | .. | 18 | 2,123 | 243 |
| Kyrgyz Republic | 18,500 | 91.1 | 1,220 | .. | .. | .. | 6 | 243 | 4 |
| Lao PDR | 21,716 | 13.8 | .. | .. | .. | .. | 6 | 211 | 2 |
| Latvia | 73,202 | 38.6 | 4,789 | 108,396 | 770,302 | 88 | 9 | 224 | 0 |
| Lebanon | 7,300 | 84.9 | .. | .. | .. | .. | 10 | 806 | 85 |
| Lesotho | 5,940 | 18.3 | .. | .. | .. | .. | 0 | 1 | 0 |
| Liberia | 10,600 | 6.2 | .. | .. | .. | .. | .. | .. | .. |
| Libya | 83,200 | 57.2 | .. | .. | .. | .. | 7 | 609 | 0 |
| Lithuania | 75,243 | 91.3 | 7,769 | 28,379 | 328,042 | 88 | 10 | 284 | 2 |
| Macedonia, FYR | 8,684 | 63.8 | 1,210 | 15,959 | 40,430 | 40 | 8 | 611 | 1 |
| Madagascar | 49,827 | 11.6 | .. | .. | .. | .. | 22 | 667 | 33 |
| Malawi | 28,400 | 18.5 | .. | 0 | 11,535 | .. | 5 | 116 | 1 |
| Malaysia | 65,877 | 75.8 | .. | 8,221 | 7,203 | 65 | 169 | 16,561 | 1,864 |
| Mali | 15,100 | 12.1 | .. | 30,578 | 35,377 | .. | 2 | 77 | 12 |
| Mauritania | 7,660 | 11.3 | .. | .. | .. | .. | 4 | 185 | 13 |
| Mauritius | 1,926 | 97.0 | .. | .. | .. | .. | 12 | 949 | 183 |
| Mexico | 329,532 | 32.8 | 197,958 | 2,578 | 61,435 | 77 | 291 | 21,001 | 318 |
| Moldova | 12,657 | 87.0 | 952 | .. | .. | .. | 4 | 135 | 1 |
| Mongolia | 49,250 | 3.5 | 126 | 253,483 | 684,165 | .. | 6 | 254 | 8 |
| Morocco | 57,707 | 56.4 | 3,035 | 18,176 | 52,224 | 69 | 45 | 3,671 | 63 |
| Mozambique | 30,400 | 18.7 | 110 | .. | .. | .. | 7 | 260 | 7 |
| Myanmar | 28,200 | 12.2 | .. | .. | .. | 60 | 12 | 600 | 7 |
| Namibia | 66,467 | 8.3 | .. | 5,607 | 133,970 | 89 | 6 | 245 | 75 |
| Nepal | 13,223 | 30.8 | .. | .. | .. | .. | 12 | 643 | 17 |
| Netherlands | 116,500 | 90.0 | 32,700 | 41,134 | 9,712 | 93 | 225 | 20,794 | 4,254 |
| New Zealand | 92,053 | 62.8 | .. | .. | 51,030 | 90 | 215 | 9,888 | 817 |
| Nicaragua | 19,032 | 11.0 | .. | .. | .. | .. | 1 | 61 | 1 |
| Niger | 10,100 | 7.9 | .. | .. | .. | .. | 2 | 77 | 12 |
| Nigeria | 194,394 | 30.9 | .. | 512 | 4,915 | 63 | 9 | 415 | 10 |
| Norway | 91,454 | 76.0 | 12,796 | .. | .. | .. | 363 | 15,157 | 201 |
| Oman | 32,800 | 30.0 | .. | .. | .. | .. | 19 | 2,120 | 157 |
| Pakistan | 254,410 | 43.0 | 96,802 | 81,899 | 17,118 | 85 | 74 | 6,252 | 339 |
| Panama | 11,400 | 34.6 | .. | .. | .. | .. | 25 | 1,117 | 22 |
| Papua New Guinea | 19,600 | 3.5 | .. | .. | .. | .. | 27 | 1,129 | 22 |
| Paraguay | 29,500 | 9.5 | .. | .. | .. | .. | 8 | 266 | 0 |
| Peru | 72,900 | 12.8 | .. | 1,397 | 4,640 | .. | 46 | 2,125 | 35 |
| Philippines | 201,994 | 21.0 | .. | 915 | 4 | .. | 44 | 5,444 | 241 |
| Poland | 364,656 | 68.3 | 72,843 | 77,593 | 171,756 | 55 | 49 | 2,373 | 76 |
| Portugal | 68,732 | 86.0 | 14,200 | 30,125 | 13,406 | 84 | 110 | 6,563 | 225 |
| Puerto Rico | 14,400 | 100.0 | .. | .. | .. | .. | .. | .. | .. |
| Romania | 198,603 | 49.5 | 13,457 | 97,692 | 135,241 | 85 | 21 | 1,186 | 12 |
| Russian Federation | 532,393 | 67.4 | 139 | 129,048 | 1,102,493 | .. | 315 | 17,688 | 1,041 |



5.8 | Transport infrastructure

| | Roads | | | Railways | | | Air | | |
|--------------------------------|------------------------|------------------------|-----------------------------|----------------------------------------|----------------------------------------------------|----------------------------------|-------------------------------|------------------------------|-----------------------------|
| | Total road network km | Paved roads % | Goods hauled million ton-km | Passenger-km per \$ million of PPP GDP | Goods transported ton-km per \$ million of PPP GDP | Diesel locomotives available (%) | Aircraft departures thousands | Passengers carried thousands | Air freight millions ton-km |
| | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 1995-2000 ^a | 2000 | 2000 | 2000 |
| Rwanda | 12,000 | 8.3 | .. | .. | .. | .. | .. | .. | .. |
| Saudi Arabia | 151,470 | 30.1 | .. | 998 | 3,811 | 80 | 109 | 12,567 | 1,000 |
| Senegal | 14,576 | 29.3 | .. | 6,609 | 37,365 | 55 | 2 | 98 | 12 |
| Sierra Leone | 11,330 | 7.9 | .. | .. | .. | .. | 0 | 18 | 0 |
| Singapore | 3,066 | 100.0 | .. | .. | .. | .. | 71 | 16,704 | 6,005 |
| Slovak Republic | 42,717 | 86.7 | 8,474 | 57,115 | 215,427 | 87 | 3 | 116 | 0 |
| Slovenia | 20,177 | 99.9 | 4,407 | 21,848 | 89,048 | .. | 12 | 628 | 4 |
| Somalia | 22,100 | 11.8 | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 362,099 | 20.3 | .. | 25,701 | 283,106 | 96 | 110 | 8,000 | 688 |
| Spain | 663,795 | 99.0 | 98,145 | 26,047 | 16,714 | 83 | 479 | 39,559 | 872 |
| Sri Lanka | 96,695 | 95.0 | 30 | 59,310 | 1,865 | 70 | 5 | 1,756 | 256 |
| Sudan | 11,900 | 36.3 | .. | .. | .. | 42 | 8 | 408 | 35 |
| Swaziland | 3,247 | .. | .. | .. | .. | .. | 0 | 0 | 0 |
| Sweden | 212,402 | 78.4 | 32,000 | 36,988 | 96,543 | .. | 248 | 13,354 | 289 |
| Switzerland | 71,011 | .. | 22,000 | .. | .. | .. | 288 | 17,216 | 1,937 |
| Syrian Arab Republic | 43,381 | 23.1 | .. | 5,688 | 28,030 | 100 | 14 | 750 | 21 |
| Tajikistan | 27,767 | 82.7 | .. | .. | .. | .. | 4 | 156 | 3 |
| Tanzania | 88,200 | 4.2 | .. | 73,054 | 73,054 | 72 | 6 | 182 | 3 |
| Thailand | 64,600 | 97.5 | .. | 26,781 | 7,923 | 94 | 102 | 17,392 | 1,713 |
| Togo | 7,520 | 31.6 | .. | .. | .. | .. | 2 | 77 | 12 |
| Trinidad and Tobago | 8,320 | 51.1 | .. | .. | .. | .. | 26 | 1,254 | 24 |
| Tunisia | 18,997 | 64.8 | .. | 21,247 | 41,961 | 71 | 20 | 1,908 | 21 |
| Turkey | 385,960 | 34.0 | 150,974 | 14,726 | 20,238 | 78 | 114 | 11,513 | 375 |
| Turkmenistan | 24,000 | 81.2 | .. | .. | .. | .. | 22 | 1,284 | 12 |
| Uganda | 27,000 | 6.7 | .. | 1,366 | 4,924 | .. | 3 | 187 | 23 |
| Ukraine | 169,491 | 96.7 | 18,206 | 296,128 | 941,037 | 87 | 28 | 963 | 11 |
| United Arab Emirates | 1,088 | 100.0 | .. | .. | .. | .. | 48 | 6,871 | 1,428 |
| United Kingdom | 371,913 | 100.0 | 150,700 | .. | .. | 75 | 872 | 70,361 | 5,161 |
| United States | 6,304,193 | 58.8 | 1,534,430 | 1,020 | 350,942 | .. | 8,766 ^b | 655,649 ^b | 30,131 ^b |
| Uruguay | 8,983 | 90.0 | .. | 6,931 | 6,126 | .. | 9 | 617 | 14 |
| Uzbekistan | 81,600 | 87.3 | .. | 42,559 | 304,816 | .. | 30 | 1,656 | 75 |
| Venezuela, RB | 96,155 | 33.6 | .. | 0 | 342 | 65 | 139 | 4,295 | 33 |
| Vietnam | 93,300 | 25.1 | .. | 18,843 | 9,807 | 95 | 28 | 2,881 | 116 |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | 67,000 | 11.5 | .. | .. | .. | .. | 11 | 844 | 32 |
| Yugoslavia, Fed. Rep. | 49,805 | 62.3 | 630 | .. | .. | .. | .. | .. | .. |
| Zambia | 66,781 | .. | .. | 24,892 | 74,141 | 67 | 6 | 89 | 0 |
| Zimbabwe | 18,338 | 47.4 | .. | .. | 145,373 | 61 | 14 | 606 | 159 |
| World | 45.1 m | | | | | 21,392 s | 1,646,775 s | | |
| Low income | 16.5 | | | | | 797 | 52,007 | | |
| Middle income | 52.3 | | | | | 4,466 | 329,757 | | |
| Lower middle income | 56.3 | | | | | 1,897 | 155,078 | | |
| Upper middle income | 47.3 | | | | | 2,569 | 174,679 | | |
| Low & middle income | 32.2 | | | | | 5,263 | 381,764 | | |
| East Asia & Pacific | 23.8 | | | | | 1,437 | 151,301 | | |
| Europe & Central Asia | 91.3 | | | | | 770 | 46,295 | | |
| Latin America & Carib. | 29.4 | | | | | 1,952 | 95,983 | | |
| Middle East & N. Africa | 66.3 | | | | | 440 | 42,285 | | |
| South Asia | 36.9 | | | | | 305 | 27,793 | | |
| Sub-Saharan Africa | 12.3 | | | | | 360 | 18,107 | | |
| High income | 92.9 | | | | | 16,129 | 1,265,012 | | |
| Europe EMU | 92.9 | | | | | 3,500 | 255,191 | | |

a. Data are for the latest year available in the period shown. b. Data cover only those carriers designated by the U.S. Department of Transportation as major and national air carriers.



About the data

Transport infrastructure—highways, railways, ports and waterways, and airports and air traffic control systems—and the services that flow from it are crucial to the activities of households, producers, and governments. Because performance indicators vary significantly by transport mode and by focus (whether physical infrastructure or the services flowing from that infrastructure), highly specialized and carefully specified indicators are required. The table provides selected indicators of the size and extent of roads, railways, and air transport systems and the volume of freight and passengers carried.

Data for most transport sectors are not internationally comparable. Unlike for demographic statistics, national income accounts, and international trade data, the collection of infrastructure data has not been “internationalized.” Data on roads are collected by the International Road Federation (IRF), and data on air transport by the International Civil Aviation Organization (ICAO). National road associations are the primary source of IRF data; in countries where such an association is lacking or does not respond, other agencies are contacted, such as road directorates, ministries of transport or public works, or central statistical offices. As a result, the compiled data are of uneven quality.

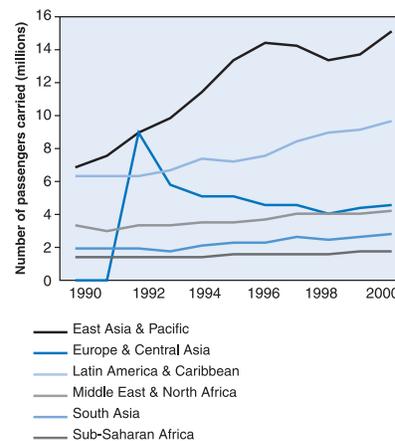
Even when data are available, they are often of limited value because of incompatible definitions, inappropriate geographical units of observation, lack of timeliness, and variations in the nature of the terrain. Data on passengers carried, for example, may be distorted because of “ticketless” travel or breaks in journeys; in such cases, the statistics may report the number of passenger-kilometers for two passengers rather than one. Measurement problems are compounded because the mix of transported commodities changes over time, and in some cases shorter-haul traffic has been excluded from intercity traffic. Finally, the quality of transport service (reliability, transit time, and condition of goods delivered) is rarely measured but may be as important as quantity in assessing an economy’s transport system. Serious efforts are needed to create international databases whose comparability and accuracy can be gradually improved.

The air transport data represent the total (international and domestic) scheduled traffic carried by the air carriers registered in a country. Countries submit air transport data to ICAO on the basis of standard instructions and definitions issued by ICAO. In many cases, however, the data include estimates by ICAO for nonreporting carriers. Where possible, these estimates are based on previous submissions supplemented by information published by the air carriers, such as flight schedules. The data represent the air traffic carried on scheduled services, but changes in air transport regulations in Europe have made it more difficult to classify

traffic as scheduled or nonscheduled. Thus, recent increases shown for some European countries may be due to changes in the classification of air traffic rather than actual growth. For countries with few air carriers or only one, the addition or discontinuation of a home-based air carrier may cause significant changes in air traffic.

Figure 5.8

Air carriers registered in East Asia and Pacific more than doubled the number of passengers they carried in the 1990s



Source: Table 5.8.

Definitions

- **Total road network** includes motorways, highways, and main or national roads, secondary or regional roads, and all other roads in a country.
- **Paved roads** are those surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones, as a percentage of all the country’s roads, measured in length.
- **Goods hauled by road** are the volume of goods transported by road vehicles, measured in millions of metric tons times kilometers traveled.
- **Railway passengers** refer to the total number of passengers transported times kilometers traveled per million dollars of GDP, measured in purchasing power parity (PPP) terms (for a discussion of PPP see *About the data* for table 1.1).
- **Goods transported by rail** are the tonnage of goods transported times kilometers traveled per million dollars of GDP, measured in purchasing power parity (PPP) terms.
- **Diesel locomotives available** are those in service as a percentage of all diesel locomotives.
- **Aircraft departures** are the number of domestic and international takeoffs of air carriers registered in the country.
- **Air passengers carried** include both domestic and international aircraft passengers of air carriers registered in the country.
- **Air freight** is the sum of the metric tons of freight, express, and diplomatic bags carried on each flight stage (the operation of an aircraft from takeoff to its next landing) multiplied by the stage distance by air carriers registered in the country.

Data sources

The data on roads are from the International Road Federation’s *World Road Statistics* and from Eurostat (europa.eu.int/eurostat.html). The railway data are from a database maintained by the World Bank’s Transportation, Water, and Urban Development Department, Transport Division. The air transport data are from the International Civil Aviation Organization’s *Civil Aviation Statistics of the World* and ICAO staff estimates.



5.9 | Power and communications

| | Electric power | | Telephone mainlines ^a | | | | | | | Mobile phones ^a | International telecommunications ^a | |
|--------------------------|----------------------------|--------------------------------------------------|----------------------------------|---------------------------------------|-----------------------------|-------------------------|-------------------|--------------------------|------------------------------------------|----------------------------|-----------------------------------------------|--------------------------------------------|
| | Consumption per capita kwh | Transmission and distribution losses % of output | per 1,000 people 2000 | In largest city per 1,000 people 2000 | Waiting list thousands 2000 | Waiting time years 2000 | per employee 2000 | Revenue per line \$ 2000 | Cost of local call \$ per 3 minutes 2000 | per 1,000 people 2000 | Outgoing traffic minutes per subscriber 2000 | Cost of call to U.S. \$ per 3 minutes 2000 |
| | | 1999 | | | | | | | | | | |
| Afghanistan | .. | .. | 1 | 10 | .. | .. | .. | .. | .. | 0 | .. | .. |
| Albania | 783 | 57 | 39 | 93 | 98.5 | 4.5 | 34 | 424 | 0.02 | 8 | 469 | 4.59 |
| Algeria | 581 | 19 | 57 | 70 | 646.0 | 5.4 | 98 | 174 | 0.01 | 3 | 86 | 4.70 |
| Angola | 84 | 15 | 5 | 21 | 21.1 | 8.5 | 33 | 1,839 | 0.05 | 2 | 509 | 5.13 |
| Argentina | 1,938 | 15 | 213 | 247 | 58.2 | 0.2 | 406 | 1,267 | 0.09 | 163 | 56 | 2.80 |
| Armenia | 957 | 25 | 152 | 212 | 80.4 | .. | 69 | 118 | 0.11 | 5 | 59 | .. |
| Australia | 8,884 | 8 | 525 | 516 | 0.0 | 0.0 | 170 | 1,458 | 0.12 | 447 | 136 | 0.54 |
| Austria | 6,176 | 8 | 467 | .. | 0.0 | 0.0 | 207 | 1,250 | 0.15 | 762 | 300 | 1.60 |
| Azerbaijan | 1,750 | 13 | 104 | 228 | 60.7 | 1.3 | 80 | 98 | 0.28 | 56 | 35 | 6.89 |
| Bangladesh | 89 | 16 | 4 | 24 | 135.1 | 3.3 | 30 | 558 | 0.03 | 1 | 91 | 4.14 |
| Belarus | 2,704 | 13 | 269 | 1,228 | 401.4 | 2.7 | 103 | 61 | .. | 5 | 65 | 6.10 |
| Belgium | 7,286 | 5 | 498 | .. | .. | .. | 223 | 932 | 0.13 | 525 | 305 | 2.00 |
| Benin | 53 | 98 | 8 | 21 | 23.0 | 4.5 | 52 | 1,062 | 0.09 | 9 | 321 | 6.90 |
| Bolivia | 390 | 18 | 61 | 115 | 7.5 | 0.2 | 103 | 826 | 0.09 | 70 | 65 | 3.70 |
| Bosnia and Herzegovina | 540 | 22 | 103 | 480 | .. | 2.2 | 225 | 440 | 0.02 | 30 | 228 | 2.96 |
| Botswana | .. | .. | 93 | .. | .. | 0.5 | 71 | 974 | 0.02 | 123 | 323 | 3.60 |
| Brazil | 1,811 | 17 | 182 | .. | .. | 0.5 | 157 | 823 | 0.03 | 136 | 21 | 1.80 |
| Bulgaria | 2,899 | 17 | 350 | 564 | 242.0 | 3.6 | 112 | 135 | 0.00 | 90 | 38 | .. |
| Burkina Faso | .. | .. | 4 | 36 | 12.3 | 2.2 | 41 | 981 | 0.08 | 2 | 202 | 11.00 |
| Burundi | .. | .. | 3 | 54 | 10.0 | 7.3 | 32 | 496 | 0.02 | 2 | 149 | 7.30 |
| Cambodia | .. | .. | 2 | 16 | .. | .. | 45 | 722 | 0.02 | 10 | 319 | .. |
| Cameroon | 184 | 21 | 6 | 38 | 50.0 | 6.2 | 42 | 729 | 0.05 | 10 | 293 | 3.39 |
| Canada | 15,260 | 7 | 677 | .. | 0.0 | 0.0 | 239 | 1,002 | .. | 285 | 347 | 1.20 |
| Central African Republic | .. | .. | 3 | .. | 1.8 | >10.0 | 23 | 1,056 | 0.48 | 1 | 478 | 8.00 |
| Chad | .. | .. | 1 | 8 | 0.6 | 0.5 | 23 | 2,200 | 0.16 | 1 | 293 | .. |
| Chile | 2,309 | 5 | 221 | 318 | 10.3 | 0.0 | 243 | 754 | 0.12 | 222 | 64 | 2.90 |
| China | 759 | 7 | 112 | 294 | .. | 0.0 | 159 | 256 | .. | 66 | 11 | 6.70 |
| Hong Kong, China | 5,178 | 13 | 583 | 583 | 0.0 | 0.0 | 102 | 1,845 | 0.00 | 809 | 801 | 2.62 |
| Colombia | 772 | 24 | 169 | 322 | 1,155.0 | 2.0 | 151 | 378 | 0.03 | 53 | 40 | 2.20 |
| Congo, Dem. Rep. | 43 | 4 | 0 | .. | .. | .. | .. | .. | .. | 0 | .. | .. |
| Congo, Rep. | 48 | 91 | 7 | .. | .. | .. | .. | .. | .. | 24 | .. | .. |
| Costa Rica | 1,426 | 8 | 249 | .. | 34.7 | 0.3 | 213 | 296 | 0.02 | 52 | 81 | 1.93 |
| Côte d'Ivoire | .. | .. | 18 | 57 | 31.7 | 0.8 | 96 | 1,923 | 0.05 | 30 | 163 | 7.86 |
| Croatia | 2,674 | 17 | 365 | .. | .. | 0.9 | 151 | 474 | 0.03 | 231 | 198 | .. |
| Cuba | 973 | 18 | 44 | 86 | .. | .. | 29 | 1,432 | 0.09 | 1 | 74 | 7.30 |
| Czech Republic | 4,682 | 8 | 378 | 676 | 32.0 | 0.2 | 164 | 660 | 0.13 | 424 | 93 | 0.97 |
| Denmark | 6,030 | 5 | 720 | .. | 0.0 | 0.0 | 180 | 1,089 | 0.10 | 631 | 183 | 1.77 |
| Dominican Republic | 646 | 27 | 105 | .. | .. | .. | 202 | .. | .. | 82 | 237 | 3.90 |
| Ecuador | 620 | 23 | 100 | 109 | .. | .. | 181 | 400 | 0.08 | 38 | 91 | 4.90 |
| Egypt, Arab Rep. | 900 | 12 | 86 | 173 | 1,300.0 | 1.9 | 100 | 498 | 0.01 | 21 | 34 | 3.33 |
| El Salvador | 568 | 13 | 100 | .. | .. | .. | 148 | 897 | 0.06 | 118 | 222 | 2.40 |
| Eritrea | .. | .. | 8 | 43 | 20.5 | 7.2 | 67 | 522 | 0.02 | 0 | 95 | 5.91 |
| Estonia | 3,435 | 18 | 363 | 422 | 24.6 | 1.4 | 172 | 553 | 0.08 | 387 | 149 | 1.62 |
| Ethiopia | 21 | 10 | 4 | 52 | 196.9 | 7.8 | 32 | 360 | 0.02 | 0 | 59 | 7.15 |
| Finland | 14,366 | 4 | 550 | .. | 0.0 | 0.0 | 118 | 1,406 | 0.12 | 720 | 164 | 1.07 |
| France | 6,392 | 6 | 579 | .. | 0.0 | 0.0 | 200 | 813 | 0.10 | 493 | 129 | 1.00 |
| Gabon | 700 | 10 | 32 | .. | .. | >10.0 | 37 | 1,801 | 0.15 | 98 | 567 | .. |
| Gambia, The | .. | .. | 26 | 81 | 16.9 | 6.0 | 31 | 807 | 0.30 | 4 | 220 | .. |
| Georgia | 1,312 | 19 | 139 | 233 | 104.8 | 2.2 | 76 | 47 | .. | 34 | 60 | 2.88 |
| Germany | 5,690 | 4 | 611 | 686 | 0.0 | 0.0 | 210 | 1,012 | 0.09 | 586 | 184 | 0.34 |
| Ghana | 204 | 1 | 12 | 54 | .. | .. | 63 | 387 | 0.03 | 6 | 185 | 1.69 |
| Greece | 3,854 | 7 | 532 | 732 | 14.1 | 0.2 | 289 | 824 | 0.07 | 557 | 140 | 0.69 |
| Guatemala | 341 | 20 | 57 | .. | .. | .. | 128 | 411 | 0.08 | 61 | 193 | 0.80 |
| Guinea | .. | .. | 8 | 19 | 1.7 | 0.1 | 75 | 449 | 0.10 | 5 | 289 | 9.04 |
| Guinea-Bissau | .. | .. | 9 | 109 | 5.1 | 4.4 | 45 | .. | .. | 0 | 272 | .. |
| Haiti | 40 | 53 | 9 | .. | .. | >10.0 | 20 | .. | .. | 3 | 204 | 7.10 |
| Honduras | 449 | 22 | 46 | 99 | 169.7 | 7.8 | 50 | 1,025 | 0.06 | 24 | 144 | 4.20 |

Power and communications | 5.9



| | Electric power | | | Telephone mainlines ^a | | | | | | | Mobile phones ^a | International telecommunications ^a | |
|--------------------|---------------------------------|-------------------------------------------------------|-----------------------|---------------------------------------|-----------------------------|-------------------------|-------------------|--------------------------|------------------------------------------|-----------------------|----------------------------------------------|-----------------------------------------------|--|
| | Consumption per capita kwh 1999 | Transmission and distribution losses % of output 1999 | per 1,000 people 2000 | In largest city per 1,000 people 2000 | Waiting list thousands 2000 | Waiting time years 2000 | per employee 2000 | Revenue per line \$ 2000 | Cost of local call \$ per 3 minutes 2000 | per 1,000 people 2000 | Outgoing traffic minutes per subscriber 2000 | Cost of call to U.S. \$ per 3 minutes 2000 | |
| Hungary | 2,874 | 13 | 372 | 581 | 27.4 | 0.1 | 182 | 845 | 0.09 | 302 | 56 | 1.28 | |
| India | 379 | 21 | 32 | 131 | 3,680.6 | 0.8 | 63 | 138 | 0.01 | 4 | 16 | 4.20 | |
| Indonesia | 345 | 12 | 31 | 232 | .. | .. | 177 | 353 | 0.02 | 17 | 38 | 4.20 | |
| Iran, Islamic Rep. | 1,407 | 15 | 149 | .. | 1,203.5 | 1.2 | 200 | 210 | 0.01 | 15 | 24 | 7.65 | |
| Iraq | 1,303 | .. | 29 | 75 | .. | .. | .. | .. | .. | 0 | 29 | .. | |
| Ireland | 5,011 | 8 | 420 | .. | .. | .. | 91 | 1,653 | 0.17 | 658 | 786 | 1.54 | |
| Israel | 5,689 | 3 | 482 | .. | .. | 0.3 | 253 | 1,735 | 0.05 | 702 | 324 | 3.30 | |
| Italy | 4,535 | 7 | 474 | .. | 0.0 | 0.0 | 358 | 1,247 | 0.12 | 737 | 101 | 1.40 | |
| Jamaica | 2,294 | 10 | 199 | .. | 209.1 | 6.5 | 175 | 949 | .. | 142 | 144 | 5.20 | |
| Japan | 7,443 | 3 | 586 | 554 | 0.0 | 0.0 | 462 | 1,641 | 0.07 | 526 | 35 | 1.67 | |
| Jordan | 1,207 | 11 | 93 | 232 | 29.7 | 0.3 | 103 | .. | 0.02 | 58 | 275 | .. | |
| Kazakhstan | 2,448 | 17 | 113 | 224 | 172.4 | >10.0 | 60 | 147 | .. | 12 | 57 | 2.68 | |
| Kenya | 126 | 20 | 10 | 78 | 134.1 | 8.1 | 16 | 955 | 0.04 | 4 | 75 | 7.35 | |
| Korea, Dem. Rep. | .. | .. | 46 | .. | .. | .. | .. | .. | .. | 0 | .. | .. | |
| Korea, Rep. | 5,160 | 4 | 464 | 1,134 | 0.0 | 0.0 | 316 | 941 | 0.03 | 567 | 48 | 1.93 | |
| Kuwait | 14,011 | .. | 244 | 47 | 0.0 | 0.0 | 61 | 841 | 0.00 | 249 | 340 | 5.41 | |
| Kyrgyz Republic | 1,512 | 27 | 77 | 158 | 58.1 | 6.9 | 52 | 60 | .. | 2 | 62 | 9.84 | |
| Lao PDR | .. | .. | 8 | .. | 5.9 | 1.1 | 36 | 634 | 0.01 | 2 | 207 | 9.20 | |
| Latvia | 1,851 | 27 | 303 | 526 | 19.2 | 3.3 | 170 | 305 | 0.11 | 166 | 79 | 2.05 | |
| Lebanon | 1,778 | 18 | 195 | 96 | .. | .. | 114 | 919 | 0.07 | 212 | 124 | 4.45 | |
| Lesotho | .. | .. | 10 | 64 | 19.0 | >10.0 | 33 | 454 | 0.01 | 10 | 1,665 | .. | |
| Liberia | .. | .. | 2 | .. | .. | >10.0 | .. | .. | .. | 0 | 791 | .. | |
| Libya | 3,876 | .. | 108 | 116 | 80.0 | 1.2 | 43 | .. | .. | 7 | 78 | .. | |
| Lithuania | 1,769 | 10 | 321 | 412 | 41.6 | 0.9 | 197 | 189 | 0.06 | 142 | 33 | 3.10 | |
| Macedonia, FYR | .. | .. | 255 | .. | .. | 1.2 | 128 | 376 | 0.01 | 57 | 188 | 4.13 | |
| Madagascar | .. | .. | 3 | 9 | 0.3 | 0.1 | 20 | 1,471 | 0.08 | 4 | 169 | 8.98 | |
| Malawi | .. | .. | 4 | 37 | 25.0 | 9.1 | 9 | 892 | 0.03 | 5 | 241 | .. | |
| Malaysia | 2,474 | 8 | 199 | 282 | .. | 0.7 | 187 | 596 | 0.02 | 213 | 193 | 2.37 | |
| Mali | .. | .. | 3 | 22 | .. | .. | 28 | 1,559 | 0.07 | 1 | 368 | 12.64 | |
| Mauritania | .. | .. | 7 | 18 | 47.8 | >10.0 | 26 | 1,341 | 0.08 | 3 | 480 | .. | |
| Mauritius | .. | .. | 235 | 319 | 18.9 | 1.0 | 153 | 515 | 0.03 | 151 | 123 | 4.00 | |
| Mexico | 1,570 | 14 | 125 | 142 | 137.3 | 0.1 | 133 | 1,065 | 0.14 | 142 | 153 | 3.01 | |
| Moldova | 620 | 26 | 133 | 320 | 124.3 | 5.5 | 79 | 86 | 0.01 | 32 | 73 | 4.10 | |
| Mongolia | .. | .. | 56 | 101 | 39.6 | 2.6 | 29 | 358 | 0.01 | 45 | 35 | 5.65 | |
| Morocco | 430 | 4 | 50 | 115 | 5.0 | 0.1 | 98 | 591 | 0.07 | 83 | 172 | 4.50 | |
| Mozambique | 53 | 10 | 4 | .. | 21.3 | 3.2 | 37 | 1,315 | 0.06 | 3 | 265 | .. | |
| Myanmar | 71 | 25 | 6 | 29 | 93.2 | 5.3 | 34 | 59 | 0.01 | 0 | 44 | .. | |
| Namibia | .. | .. | 63 | 181 | 2.4 | 0.7 | 66 | 854 | 0.05 | 47 | 561 | 4.28 | |
| Nepal | 47 | 23 | 12 | .. | 283.4 | 6.7 | 57 | 263 | 0.01 | 0 | 98 | .. | |
| Netherlands | 5,993 | 5 | 618 | .. | 0.0 | 0.0 | 169 | 1,130 | 0.13 | 670 | 286 | 0.30 | |
| New Zealand | 8,426 | 12 | 500 | .. | 0.0 | 0.0 | 358 | 1,307 | 0.00 | 563 | 340 | 0.90 | |
| Nicaragua | 268 | 26 | 31 | 74 | 108.4 | 9.1 | 65 | 637 | 0.08 | 18 | 339 | 3.20 | |
| Niger | .. | .. | 2 | 21 | .. | .. | 14 | 844 | 0.10 | 0 | 191 | 9.03 | |
| Nigeria | 85 | 32 | 4 | 11 | 42.0 | 1.4 | 36 | 3,763 | .. | 0 | 144 | .. | |
| Norway | 24,248 | 8 | 532 | 823 | 0.0 | 0.0 | 104 | 1,912 | 0.13 | 751 | 234 | 0.40 | |
| Oman | 2,880 | 17 | 89 | .. | .. | 0.5 | 109 | 1,734 | 0.07 | 65 | 518 | .. | |
| Pakistan | 321 | 30 | 22 | 62 | 298.0 | 1.8 | 55 | 364 | 0.01 | 2 | 32 | 3.60 | |
| Panama | 1,310 | 19 | 151 | 284 | .. | .. | 78 | 1,019 | 0.06 | 145 | 121 | 4.36 | |
| Papua New Guinea | .. | .. | 13 | .. | .. | .. | 36 | 1,031 | .. | 2 | 368 | .. | |
| Paraguay | 789 | 3 | 50 | .. | 20.1 | 0.7 | 46 | 685 | 0.06 | 149 | 129 | 6.10 | |
| Peru | 654 | 12 | 64 | .. | 29.6 | 1.2 | 258 | 850 | 0.06 | 48 | 68 | 2.40 | |
| Philippines | 454 | 15 | 40 | 142 | .. | .. | 230 | 623 | 0.00 | 84 | 45 | 4.80 | |
| Poland | 2,388 | 10 | 282 | 199 | 926.0 | 0.8 | 159 | 646 | 0.08 | 174 | 62 | 2.92 | |
| Portugal | 3,616 | 8 | 430 | .. | 25.6 | 0.2 | 234 | 1,155 | 0.10 | 665 | 118 | 0.89 | |
| Puerto Rico | .. | .. | 332 | .. | .. | .. | 226 | 897 | .. | 237 | .. | 0.87 | |
| Romania | 1,511 | 13 | 175 | 368 | 640.0 | 3.8 | 92 | 222 | 0.11 | 112 | 43 | 2.49 | |
| Russian Federation | 4,050 | 11 | 218 | 463 | 6,533.0 | 5.1 | 75 | 161 | 0.01 | 22 | 29 | 6.12 | |



5.9 | Power and communications

| | Electric power | | Telephone mainlines ^a | | | | | | | Mobile phones ^a | International telecommunications ^a | |
|--------------------------------|----------------------------|--------------------------------------------------|----------------------------------|----------------------------------|------------------------|--------------------|--------------|---------------------|-------------------------------------|----------------------------|-----------------------------------------------|---------------------------------------|
| | Consumption per capita kwh | Transmission and distribution losses % of output | per 1,000 people | In largest city per 1,000 people | Waiting list thousands | Waiting time years | per employee | Revenue per line \$ | Cost of local call \$ per 3 minutes | per 1,000 people | Outgoing traffic minutes per subscriber | Cost of call to U.S. \$ per 3 minutes |
| | | 1999 | | | | | | | | | | |
| Rwanda | .. | .. | 2 | 43 | 8.0 | 4.0 | 57 | 1,035 | 0.03 | 5 | 306 | .. |
| Saudi Arabia | 4,710 | 8 | 137 | 253 | 927.4 | 2.6 | 124 | 1,503 | 0.01 | 64 | 324 | 5.20 |
| Senegal | 114 | 17 | 22 | 58 | 24.6 | 0.8 | 140 | 861 | 0.10 | 26 | 243 | 2.23 |
| Sierra Leone | .. | .. | 4 | 18 | 25.0 | >10.0 | 19 | .. | 0.03 | 2 | 279 | .. |
| Singapore | 6,641 | 4 | 484 | 484 | 0.0 | 0.0 | 222 | 1,245 | 0.02 | 684 | 538 | 0.68 |
| Slovak Republic | 4,216 | 7 | 314 | 670 | 69.3 | 0.7 | 112 | 460 | 0.10 | 205 | 96 | 1.13 |
| Slovenia | 5,218 | 5 | 386 | .. | 1.4 | 0.1 | 207 | 442 | 0.04 | 612 | 199 | 0.81 |
| Somalia | .. | .. | 2 | 11 | .. | .. | .. | .. | .. | 0 | .. | .. |
| South Africa | 3,776 | 8 | 114 | .. | .. | 1.1 | 113 | 1,369 | 0.09 | 190 | 100 | 1.98 |
| Spain | 4,497 | 10 | 421 | 485 | 4.3 | 0.0 | 415 | 1,528 | 0.09 | 609 | 150 | 1.88 |
| Sri Lanka | 255 | 21 | 41 | 284 | 269.5 | 1.9 | 64 | 506 | 0.04 | 23 | 55 | 3.05 |
| Sudan | 46 | 31 | 12 | 46 | 405.0 | 4.4 | 138 | 3,386 | 0.23 | 1 | 83 | .. |
| Swaziland | .. | .. | 32 | 115 | 17.0 | 7.2 | 64 | 925 | 0.04 | 33 | 831 | .. |
| Sweden | 14,138 | 7 | 682 | .. | 0.0 | 0.0 | 211 | 1,205 | .. | 717 | 209 | 0.90 |
| Switzerland | 7,291 | 6 | 727 | .. | 0.0 | 0.0 | 211 | 1,593 | 0.11 | 644 | 458 | 1.00 |
| Syrian Arab Republic | 863 | .. | 103 | 141 | 3,025.8 | >10.0 | 79 | 949 | 0.02 | 2 | 101 | 20.04 |
| Tajikistan | 2,163 | 13 | 36 | 131 | 10.3 | .. | 44 | 32 | 0.01 | 0 | 29 | 8.16 |
| Tanzania | 55 | 22 | 5 | 31 | 29.6 | 1.3 | 47 | 812 | 0.08 | 5 | 75 | 13.30 |
| Thailand | 1,352 | 8 | 92 | 384 | 415.2 | 1.6 | 169 | 579 | 0.07 | 50 | 64 | 2.50 |
| Togo | .. | .. | 9 | 35 | 16.8 | 2.9 | 49 | 912 | 0.09 | 11 | 240 | 7.90 |
| Trinidad and Tobago | 3,527 | 8 | 231 | 200 | 10.0 | 0.5 | 98 | 808 | 0.03 | 103 | 243 | 3.30 |
| Tunisia | 911 | 10 | 90 | 96 | 83.7 | 0.9 | 129 | 445 | 0.02 | 6 | 165 | .. |
| Turkey | 1,396 | 19 | 280 | 388 | 417.7 | 0.5 | 254 | 291 | 0.11 | 246 | 40 | 3.30 |
| Turkmenistan | 944 | 13 | 82 | 155 | 58.6 | 8.5 | 48 | 104 | .. | 2 | 46 | .. |
| Uganda | .. | .. | 3 | 37 | 9.2 | 3.6 | 25 | 1,549 | 0.13 | 8 | 183 | .. |
| Ukraine | 2,306 | 18 | 199 | 418 | 2,654.9 | 7.9 | 80 | 82 | 0.00 | 16 | 38 | .. |
| United Arab Emirates | 10,643 | 9 | 391 | 347 | 0.3 | 0.0 | 122 | 1,853 | 0.00 | 548 | 1,102 | 3.51 |
| United Kingdom | 5,384 | 8 | 589 | .. | 0.0 | 0.0 | 170 | 1,508 | 0.17 | 727 | 227 | 1.10 |
| United States | 11,994 | 8 | 700 | .. | 0.0 | 0.0 | 172 | 1,466 | 0.00 | 398 | 153 | .. |
| Uruguay | 1,871 | 19 | 278 | 336 | 0.0 | 0.0 | 169 | 837 | 0.17 | 132 | 90 | 4.88 |
| Uzbekistan | 1,650 | 9 | 67 | 248 | 33.1 | 0.9 | 64 | 137 | 0.01 | 2 | 46 | 13.95 |
| Venezuela, RB | 2,493 | 23 | 108 | .. | .. | .. | 137 | 1,385 | 0.10 | 217 | 72 | 5.20 |
| Vietnam | 252 | 15 | 32 | 133 | .. | .. | .. | 425 | 0.02 | 10 | 22 | .. |
| West Bank and Gaza | .. | .. | .. | .. | .. | 0.7 | .. | .. | 0.04 | .. | .. | .. |
| Yemen, Rep. | 110 | 26 | 19 | 77 | 159.5 | 3.8 | 66 | 271 | 0.01 | 2 | 105 | 4.45 |
| Yugoslavia, Fed. Rep. | .. | .. | 226 | 462 | 131.0 | 1.8 | 160 | 147 | 0.01 | 123 | 119 | 12.08 |
| Zambia | 540 | 11 | 8 | 24 | 13.3 | 6.7 | 26 | 565 | 0.06 | 9 | 160 | 2.57 |
| Zimbabwe | 894 | 17 | 18 | 70 | 158.9 | >10.0 | 54 | 427 | 0.04 | 23 | 275 | 4.36 |
| World | 2,108 w | 9 w | 163 w | 222 w | .. w | 1.1 m | 221 m | 1,029 m | 0.06 m | 123 m | 144 m | 4.00 m |
| Low income | 358 | 19 | 23 | 117 | 8,880.0 | 4.4 | 74 | 199 | 0.03 | 5 | 155 | .. |
| Middle income | 1,393 | 11 | 139 | 286 | .. | 1.0 | 164 | 840 | 0.06 | 93 | 93 | 4.36 |
| Lower middle income | 1,066 | 10 | 116 | 290 | .. | 1.9 | 138 | 846 | 0.06 | 58 | 86 | 4.70 |
| Upper middle income | 2,427 | 12 | 213 | .. | .. | 0.5 | 209 | 830 | 0.08 | 201 | 94 | 2.37 |
| Low & middle income | 923 | 12 | 84 | 194 | .. | 1.9 | 151 | 816 | 0.05 | 51 | 100 | 4.70 |
| East Asia & Pacific | 816 | 7 | 101 | 270 | .. | 1.2 | 179 | 365 | 0.02 | 70 | 48 | 5.30 |
| Europe & Central Asia | 2,679 | 13 | 222 | 449 | 13,617.1 | 1.8 | 137 | 1,703 | 0.08 | 92 | 60 | 2.94 |
| Latin America & Carib. | 1,470 | 16 | 148 | .. | .. | 0.5 | 189 | 889 | 0.06 | 123 | 106 | 3.20 |
| Middle East & N. Africa | 1,289 | 12 | 92 | 127 | 6,294.6 | 1.2 | 138 | 486 | 0.01 | 30 | 139 | .. |
| South Asia | 337 | 22 | 27 | 118 | 4,364.0 | 1.9 | 61 | 175 | 0.01 | 3 | 55 | 3.60 |
| Sub-Saharan Africa | 435 | 11 | 14 | 33 | 1,294.7 | 4.4 | 97 | 1,266 | 0.06 | 17 | 241 | .. |
| High income | 8,496 | 7 | 604 | .. | 66.0 | 0.0 | 246 | 1,321 | 0.09 | 532 | 234 | 1.78 |
| Europe EMU | 5,550 | 6 | 534 | .. | 14.1 | 0.0 | 267 | 1,077 | 0.10 | 611 | 174 | 1.67 |

a. Data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2001*. Please cite the ITU for third-party use of these data.



About the data

The quality of an economy's infrastructure, including power, communications, and transport, are important elements in both domestic and foreign investors' decisions to invest. Competition in the marketplace, with sound regulation, is lowering costs and improving the quality of and access to telecommunications services around the globe.

An economy's production and consumption of electricity is a basic indicator of its size and level of development. Although a few countries export electric power, most production is for domestic consumption. Expanding the supply of electricity to meet the growing demand of increasingly urbanized and industrialized economies without incurring unacceptable social, economic, and environmental costs is one of the great challenges facing developing countries.

Data on electric power production and consumption are collected from national energy agencies by the International Energy Agency (IEA) and adjusted by the IEA to meet international definitions (for data on electricity production see table 3.9). Electricity consumption is equivalent to production less power plants' own use and transmission, distribution, and transformation losses. It includes consumption by auxiliary stations, losses in transformers that are considered integral parts of those stations, and electricity produced by pumping installations. It covers electricity generated by primary sources of energy—coal, oil, gas, nuclear, hydro, geothermal, wind, tide and wave, and combustible renewables—where data are available. Neither production nor consumption data capture the reliability of supplies, including breakdowns, load factors, and frequency of outages.

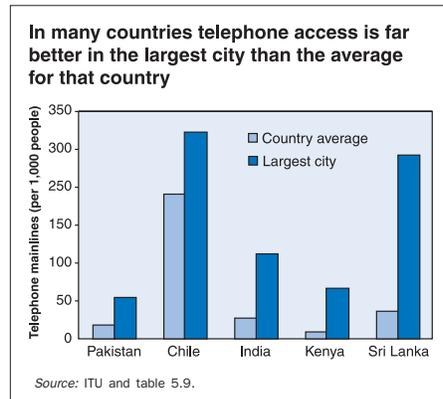
Over the past decade new financing and technology along with privatization and liberalization have spurred dramatic growth in telecommunications in many countries. The table presents some common performance indicators for telecommunications, including measures of supply and demand, service quality, productivity, economic and financial performance, and tariffs. The quality of data varies among reporting countries as a result of differences in regulatory obligations for the provision of data.

Demand for telecommunications is often measured by the sum of telephone mainlines and registered applicants for new connections. (A mainline is normally identified by a unique number that is the one billed.) In some countries the list of registered applicants does not reflect real current pending demand, which is often hidden or suppressed, reflecting an extremely short supply that has discouraged potential applicants from applying for telephone service. And in some cases waiting lists may overstate demand because applicants have placed their names on the list several times to improve their chances. Waiting time is calculated by dividing the number of applicants on the wait-

ing list by the average number of mainlines added each year over the past three years. The number of mainlines no longer reflects a telephone system's full capacity because mobile telephones—whose use has been expanding rapidly in most countries, rich and poor—provide an alternative point of access.

The table includes four measures of efficiency in telecommunications: waiting list, waiting time, mainlines per employee, and revenue per mainline. Caution should be used in interpreting the estimates of mainlines per employee because firms often subcontract part of their work. The cross-country comparability of revenue per mainline may also be limited because, for example, some countries do not require telecommunications providers to submit financial information; the data usually do not include revenues from cellular and mobile phones or radio, paging, and data services; and there are definitional and accounting differences between countries.

Figure 5.9



Definitions

- **Electric power consumption** measures the production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants.
- **Electric power transmission and distribution losses** are losses in transmission between sources of supply and points of distribution and in distribution to consumers, including pilferage.
- **Telephone mainlines** are telephone lines connecting a customer's equipment to the public switched telephone network. Data are presented for the entire country and for the largest city.
- **Waiting list** shows the number of applications for a connection to a mainline that have been held up by a lack of technical capacity.
- **Waiting time** is the approximate number of years applicants must wait for a telephone line.
- **Mainlines per employee** are calculated by dividing the number of mainlines by the number of telecommunications staff (with part-time staff converted to full-time equivalents) employed by telecommunications enterprises providing public telecommunications services.
- **Revenue per line** is the revenue received by firms per mainline for providing telecommunications services.
- **Cost of local call** is the cost of a three-minute, peak rate, fixed-line call within the same exchange area using the subscriber's equipment (that is, not from a public phone).
- **Mobile phones** refer to users of portable telephones subscribing to an automatic public mobile telephone service using cellular technology that provides access to the public switched telephone network, per 1,000 people.
- **Outgoing traffic** is the telephone traffic, measured in minutes per subscriber, that originates in the country and has a destination outside the country.
- **Cost of call to U.S.** is the cost of a three-minute peak rate call from the country to the United States.

Data sources

The data on electricity consumption and losses are from the IEA's *Energy Statistics and Balances of Non-OECD Countries 1998–99*, the IEA's *Energy Statistics of OECD Countries 1998–99*, and the United Nations Statistics Division's *Energy Statistics Yearbook*. The telecommunications data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2001*.



5.10 | The information age

| | Daily newspapers | Radios | Television ^a | | Personal computers ^a | Personal computers installed in education | Internet | | | | Information and communications technology expenditures | | |
|--------------------------|------------------|------------------|-------------------------|------------------------------------|---------------------------------|-------------------------------------------|------------------------------|----------------------------------------------|----------------------------|---------------------------|--------------------------------------------------------|----------|------------|
| | per 1,000 people | per 1,000 people | Sets per 1,000 people | Cable subscribers per 1,000 people | per 1,000 people | Total | Users thousands ^a | Monthly off-peak access charges ^a | Service provider charge \$ | Telephone usage charge \$ | Secure servers | % of GDP | per capita |
| | 1998 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2001 | 2001 | 2001 | 2000 | 2000 |
| Afghanistan | 5 | 114 | 14 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Albania | 35 | 243 | 123 | .. | 6.4 | .. | 4 | 19 | 0.20 | 1 | .. | .. | .. |
| Algeria | 27 | 244 | 110 | .. | 6.5 | .. | 50 | 27 | 0.17 | .. | .. | .. | .. |
| Angola | 11 | 74 | 19 | .. | 1.1 | .. | 30 | 20 | 0.57 | .. | .. | .. | .. |
| Argentina | 37 | 681 | 293 | 163.1 | 51.3 | 122,881 | 2,500 | 78 | 0.47 | 238 | 4.1 | 317 | .. |
| Armenia | 6 | 225 | 244 | 0.9 | 7.1 | .. | 50 | 42 | 0.78 | 1 | .. | .. | .. |
| Australia | 293 | 1,908 | 738 | 68.0 | 464.6 | 610,745 | 6,600 | 13 | 2.60 | 3,422 | 9.7 | 1,922 | .. |
| Austria | 296 | 753 | 536 | 123.4 | 276.5 | 128,606 | 2,100 | .. | 17.21 | 669 | 7.2 | 1,697 | .. |
| Azerbaijan | 27 | 22 | 259 | 0.3 | .. | .. | 12 | .. | 2.15 | 1 | .. | .. | .. |
| Bangladesh | 53 | 49 | 7 | .. | 1.5 | .. | 100 | 17 | 0.33 | 1 | .. | .. | .. |
| Belarus | 155 | 299 | 342 | 33.2 | .. | .. | 180 | 15 | 54.25 | 4 | .. | .. | .. |
| Belgium | 160 | 793 | 541 | 372.9 | 344.5 | 167,526 | 2,326 | .. | 27.52 | 342 | 8.0 | 1,769 | .. |
| Benin | 2 | 439 | 45 | .. | 1.6 | .. | 15 | 129 | 0.93 | 1 | .. | .. | .. |
| Bolivia | 992 | 676 | 119 | 9.6 | 16.8 | .. | 120 | .. | .. | 5 | .. | .. | .. |
| Bosnia and Herzegovina | 152 | 243 | 111 | .. | .. | .. | 20 | 19 | 0.13 | .. | .. | .. | .. |
| Botswana | 27 | 155 | 25 | .. | 37.0 | .. | 15 | 15 | 0.14 | .. | .. | .. | .. |
| Brazil | 43 | 433 | 343 | 13.7 | 44.1 | 690,196 | 5,000 | .. | .. | 1,028 | 8.4 | 289 | .. |
| Bulgaria | 257 | 543 | 449 | 130.1 | 43.9 | 20,936 | 430 | 8 | 0.02 | 18 | 4.1 | 61 | .. |
| Burkina Faso | 1 | 35 | 12 | .. | 1.3 | .. | 10 | 29 | 0.84 | .. | .. | .. | .. |
| Burundi | 0 | 220 | 30 | .. | .. | .. | 3 | .. | 0.18 | .. | .. | .. | .. |
| Cambodia | 2 | 119 | 8 | .. | 1.1 | .. | 6 | 104 | 0.30 | 2 | .. | .. | .. |
| Cameroon | 7 | 163 | 34 | .. | 3.3 | .. | 40 | 77 | 0.56 | .. | .. | .. | .. |
| Canada | 159 | 1,047 | .. | 259.4 | 390.2 | 893,745 | 12,700 | 12 | 0.00 | 5,055 | 8.4 | 1,911 | .. |
| Central African Republic | 2 | 80 | 6 | .. | 1.7 | .. | 2 | 166 | 1.40 | .. | .. | .. | .. |
| Chad | 0 | 236 | 1 | .. | 1.3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Chile | 98 | 354 | 242 | 44.9 | 82.3 | 108,907 | 2,537 | .. | .. | 141 | 7.8 | 360 | .. |
| China | .. | 339 | 293 | 61.1 | 15.9 | 1,539,843 | 22,500 | 7 | 0.14 | 184 | 5.4 | 46 | .. |
| Hong Kong, China | 792 | 684 | 493 | 78.6 | 350.6 | 127,491 | 2,601 | 18 | 0.00 | 538 | 8.8 | 2,085 | .. |
| Colombia | 46 | 544 | 282 | 13.6 | 35.4 | 108,209 | 878 | .. | 0.25 | 71 | 12.0 | 228 | .. |
| Congo, Dem. Rep. | 3 | 386 | 2 | .. | .. | .. | 1 | 95 | .. | .. | .. | .. | .. |
| Congo, Rep. | 8 | 123 | 13 | .. | 3.5 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Costa Rica | 91 | 816 | 231 | 19.1 | 149.1 | .. | 250 | 16 | 0.10 | 56 | .. | .. | .. |
| Côte d'Ivoire | 16 | 137 | 60 | .. | 6.1 | .. | 40 | 183 | 0.25 | 1 | .. | .. | .. |
| Croatia | 114 | 340 | 293 | 38.0 | 80.7 | .. | 250 | 20 | 0.42 | 61 | .. | .. | .. |
| Cuba | 118 | 353 | 250 | .. | 10.7 | .. | 60 | .. | .. | 2 | .. | .. | .. |
| Czech Republic | 254 | 803 | 508 | 93.2 | 122.0 | 96,539 | 1,000 | .. | 11.60 | 273 | 9.3 | 453 | .. |
| Denmark | 304 | 1,349 | 807 | 264.8 | 431.5 | 145,118 | 1,950 | 21 | 0.00 | 396 | 9.2 | 2,778 | .. |
| Dominican Republic | 156 | 181 | 97 | .. | .. | .. | 55 | 18 | 0.00 | 8 | .. | .. | .. |
| Ecuador | 43 | 418 | 218 | 25.7 | 21.7 | .. | 180 | .. | .. | 11 | .. | .. | .. |
| Egypt, Arab Rep. | 35 | 339 | 189 | .. | 22.1 | 41,443 | 450 | 9 | 0.14 | 11 | 2.4 | 36 | .. |
| El Salvador | 28 | 478 | 201 | 49.7 | 19.1 | .. | 50 | 26 | 0.62 | 7 | .. | .. | .. |
| Eritrea | .. | 444 | 26 | .. | 1.6 | .. | 5 | 23 | 0.21 | .. | .. | .. | .. |
| Estonia | 176 | 1,096 | 591 | 90.3 | 152.9 | .. | 392 | .. | 0.57 | 80 | .. | .. | .. |
| Ethiopia | 0 | 189 | 6 | .. | 0.9 | .. | 10 | 94 | 0.24 | 3 | .. | .. | .. |
| Finland | 455 | 1,623 | 692 | 183.5 | 396.1 | 181,259 | 1,927 | .. | 10.62 | 498 | 7.8 | 1,835 | .. |
| France | 201 | 950 | 628 | 45.2 | 304.3 | 759,726 | 8,500 | 20 | 0.00 | 1,641 | 8.7 | 1,916 | .. |
| Gabon | 30 | 501 | 326 | 8.4 | 9.8 | .. | 15 | 35 | 1.26 | 1 | .. | .. | .. |
| Gambia, The | 2 | 396 | 3 | .. | 11.5 | .. | 4 | 18 | 2.70 | .. | .. | .. | .. |
| Georgia | .. | 556 | 474 | 2.7 | .. | .. | 23 | 20 | 0.00 | 10 | .. | .. | .. |
| Germany | 305 | 948 | 586 | 246.8 | 336.0 | 961,501 | 24,000 | 13 | 0.00 | 5,156 | 7.9 | 1,798 | .. |
| Ghana | 14 | 710 | 118 | .. | 3.0 | .. | 30 | 36 | 0.38 | 1 | .. | .. | .. |
| Greece | 23 | 478 | 488 | .. | 70.5 | 68,329 | 1,000 | 15 | 5.40 | 116 | 6.1 | 659 | .. |
| Guatemala | 33 | 79 | 61 | .. | 11.4 | .. | 80 | .. | .. | 12 | .. | .. | .. |
| Guinea | .. | 52 | 44 | .. | 3.7 | .. | 8 | 58 | 0.86 | .. | .. | .. | .. |
| Guinea-Bissau | 5 | 44 | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. |
| Haiti | 3 | 55 | 5 | .. | .. | .. | 6 | .. | .. | 1 | .. | .. | .. |
| Honduras | 55 | 412 | 96 | 7.7 | 10.8 | .. | 40 | 15 | 0.61 | 4 | .. | .. | .. |



| | Daily newspapers | Radios | Television ^a | | Personal computers ^a | Personal computers installed in education | Internet | | | | Information and communications technology expenditures | |
|--------------------|--------------------------|--------------------------|-------------------------------|--------------------------------------------|---------------------------------|-------------------------------------------|-----------------------------------------|------------------------------------|-----------------------------------|------------------------|--------------------------------------------------------|--------------------|
| | per 1,000 people 1998 | per 1,000 people 2000 | Sets per 1,000 people 2000 | Cable subscribers per 1,000 people 2000 | per 1,000 people 2000 | Total 2000 | Users thousands ^a 2000 | Service provider charge \$ 2001 | Telephone usage charge \$ 2001 | Secure servers 2001 | % of GDP 2000 | per capita 2000 |
| | | | 2000 | 2000 | | | | | | | 2000 | 2000 |
| Hungary | 46 | 690 | 437 | 157.6 | 85.3 | 66,841 | 1,480 | 13 | 13.59 | 127 | 8.7 | 431 |
| India | 48 | 121 | 78 | 38.5 | 4.5 | 161,014 | 5,000 | 10 | 0.18 | 122 | 3.8 | 18 |
| Indonesia | 23 | 157 | 149 | 0.2 | 9.9 | 46,483 | 2,000 | 12 | 0.20 | 60 | 2.2 | 16 |
| Iran, Islamic Rep. | 28 | 281 | 163 | .. | 62.8 | .. | 250 | .. | .. | 1 | .. | .. |
| Iraq | 19 | 222 | 83 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ireland | 150 | 695 | 399 | 176.9 | 359.1 | 45,138 | 784 | .. | 16.45 | 350 | 6.7 | 1,676 |
| Israel | 290 | 526 | 335 | 185.0 | 253.6 | .. | 1,270 | 11 | 0.18 | 301 | 7.4 | .. |
| Italy | 104 | 878 | 494 | 1.0 | 179.8 | 720,911 | 13,200 | .. | 17.62 | 1,041 | 5.7 | 1,068 |
| Jamaica | 62 | 784 | 194 | 98.9 | 46.6 | .. | 80 | 49 | .. | 5 | .. | .. |
| Japan | 578 | 956 | 725 | 147.4 | 315.2 | 1,918,000 | 47,080 | 17 | 27.67 | 5,153 | 8.3 | 3,118 |
| Jordan | 77 | 372 | 84 | 0.2 | 22.5 | .. | 127 | 24 | 0.42 | 2 | .. | .. |
| Kazakhstan | .. | 422 | 241 | .. | .. | .. | 100 | 1 | 0.02 | 8 | .. | .. |
| Kenya | 10 | 223 | 25 | .. | 4.9 | .. | 200 | 66 | 0.46 | 1 | .. | .. |
| Korea, Dem. Rep. | 208 | 154 | 54 | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Korea, Rep. | 393 | 1,033 | 364 | 177.4 | 237.9 | 405,492 | 19,040 | 8 | 0.00 | 345 | 6.6 | 641 |
| Kuwait | 374 | 624 | 486 | .. | 130.6 | .. | 150 | 32 | 0.00 | 4 | .. | .. |
| Kyrgyz Republic | 15 | 111 | 49 | .. | .. | .. | 52 | 10 | 0.00 | 2 | .. | .. |
| Lao PDR | 4 | 148 | 10 | .. | 2.6 | .. | 6 | 50 | 0.17 | .. | .. | .. |
| Latvia | 247 | 695 | 789 | 76.7 | 140.3 | .. | 150 | 29 | 0.82 | 43 | .. | .. |
| Lebanon | 107 | 687 | 335 | 5.9 | 50.1 | .. | 300 | 60 | 0.36 | 19 | .. | .. |
| Lesotho | 8 | 53 | 16 | .. | .. | .. | 4 | 12 | 0.17 | .. | .. | .. |
| Liberia | 12 | 274 | 25 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Libya | 15 | 273 | 137 | .. | .. | .. | 10 | 108 | 0.20 | .. | .. | .. |
| Lithuania | 29 | 500 | 422 | 89.2 | 64.9 | .. | 225 | 45 | 0.38 | 43 | .. | .. |
| Macedonia, FYR | .. | 205 | 282 | .. | .. | .. | 50 | 12 | 0.04 | .. | .. | .. |
| Madagascar | 5 | 216 | 24 | .. | 2.2 | .. | 30 | 66 | 0.44 | .. | .. | .. |
| Malawi | 3 | 499 | 3 | 0.0 | 1.2 | .. | 15 | .. | 0.25 | .. | .. | .. |
| Malaysia | 158 | 420 | 168 | .. | 103.1 | 100,706 | 3,700 | 5 | 0.24 | 146 | 6.8 | 259 |
| Mali | 1 | 56 | 14 | .. | 1.2 | .. | 19 | 70 | 0.72 | 1 | .. | .. |
| Mauritania | 0 | 149 | 96 | .. | 9.4 | .. | 5 | 29 | 0.76 | 1 | .. | .. |
| Mauritius | 71 | 379 | 268 | .. | 100.5 | .. | 87 | 23 | 0.38 | 12 | .. | .. |
| Mexico | 98 | 330 | 283 | 23.1 | 50.6 | 395,813 | 2,712 | 11 | 0.00 | 259 | 3.2 | 189 |
| Moldova | 154 | 758 | 297 | 11.8 | 14.5 | .. | 53 | 33 | 0.17 | 3 | .. | .. |
| Mongolia | .. | 154 | 65 | .. | 12.6 | .. | 30 | 52 | 0.17 | 1 | .. | .. |
| Morocco | 26 | 243 | 166 | .. | 12.3 | .. | 200 | 26 | 0.75 | 5 | .. | .. |
| Mozambique | 3 | 44 | 5 | .. | 3.0 | .. | 30 | .. | .. | .. | .. | .. |
| Myanmar | 9 | 66 | 7 | .. | 1.1 | .. | 7 | .. | .. | .. | .. | .. |
| Namibia | 19 | 141 | 38 | .. | 34.2 | .. | 30 | .. | .. | 3 | .. | .. |
| Nepal | .. | 39 | 7 | 2.9 | 3.0 | .. | 50 | 16 | 0.07 | .. | .. | .. |
| Netherlands | 306 | 980 | 538 | 387.8 | 394.1 | 624,592 | 3,900 | .. | 16.40 | 798 | 9.4 | 2,198 |
| New Zealand | 207 | 997 | 522 | 4.4 | 360.2 | 189,785 | 830 | 11 | 0.00 | 609 | 13.6 | 1,771 |
| Nicaragua | 30 | 270 | 69 | 10.8 | 8.9 | .. | 50 | 30 | 0.54 | 6 | .. | .. |
| Niger | 0 | 121 | 37 | .. | 0.5 | .. | 5 | 63 | 0.53 | .. | .. | .. |
| Nigeria | 24 | 200 | 68 | .. | 6.6 | .. | 200 | 44 | 0.57 | 1 | .. | .. |
| Norway | 585 | 915 | 669 | 183.6 | 490.5 | 144,078 | 2,200 | 11 | 20.64 | 369 | 6.9 | 2,445 |
| Oman | .. | 621 | 563 | .. | 31.5 | .. | 90 | 19 | 0.79 | 2 | .. | .. |
| Pakistan | 30 | 105 | 131 | 0.1 | 4.2 | .. | 134 | 13 | 0.20 | 6 | .. | .. |
| Panama | 62 | 300 | 194 | .. | 37.0 | .. | 90 | .. | .. | 29 | .. | .. |
| Papua New Guinea | 14 | 86 | 17 | .. | .. | .. | 135 | 34 | 2.52 | .. | .. | .. |
| Paraguay | 43 | 182 | 218 | 17.8 | 12.7 | .. | 40 | .. | .. | 4 | .. | .. |
| Peru | 0 | 273 | 148 | 13.6 | 40.9 | .. | 2,500 | .. | .. | 35 | .. | .. |
| Philippines | 82 | 161 | 144 | 13.1 | 19.3 | 66,336 | 2,000 | 24 | 0.00 | 68 | 3.8 | 38 |
| Poland | 108 | 523 | 400 | 92.6 | 68.9 | 219,416 | 2,800 | .. | 18.39 | 326 | 5.9 | 248 |
| Portugal | 32 | 304 | 630 | 92.3 | 299.3 | 48,511 | 2,500 | .. | 13.00 | 138 | 7.1 | 743 |
| Puerto Rico | 126 | 742 | 330 | 72.1 | .. | .. | 400 | 43 | 1.30 | 63 | .. | .. |
| Romania | 300 | 334 | 381 | 157.7 | 31.9 | 32,414 | 800 | 15 | 0.37 | 53 | 2.3 | 38 |
| Russian Federation | 105 | 418 | 421 | .. | 42.9 | 424,284 | 3,100 | 15 | 0.14 | 285 | 3.7 | 63 |



5.10 | The information age

| | Daily newspapers | Radios | Television ^a | | Personal computers ^a | Personal computers installed in education | Internet | | | Information and communications technology expenditures | | |
|--------------------------------|------------------|------------------|-------------------------|------------------------------------|---------------------------------|-------------------------------------------|----------------------------------------------|----------------------------|---------------------------|--------------------------------------------------------|----------|------------|
| | per 1,000 people | per 1,000 people | Sets per 1,000 people | Cable subscribers per 1,000 people | per 1,000 people | Total | Monthly off-peak access charges ^a | Service provider charge \$ | Telephone usage charge \$ | Secure servers | % of GDP | per capita |
| | 1998 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2001 | 2001 | 2001 | 2000 | 2000 |
| Rwanda | 0 | 76 | 0 | .. | .. | .. | 5 | 38 | 0.36 | 1 | .. | .. |
| Saudi Arabia | 326 | 326 | 264 | 4.0 | 60.2 | .. | 200 | 31 | 0.13 | 11 | .. | .. |
| Senegal | 5 | 141 | 40 | .. | 16.8 | .. | 40 | 14 | 0.53 | 1 | .. | .. |
| Sierra Leone | 4 | 259 | 13 | .. | .. | .. | 5 | .. | .. | 1 | .. | .. |
| Singapore | 298 | 672 | 304 | 63.5 | 483.1 | 120,000 | 1,200 | .. | 0.12 | 525 | 9.7 | 2,104 |
| Slovak Republic | 174 | 965 | 407 | 139.7 | 136.9 | 26,461 | 650 | 9 | 0.54 | 79 | 7.5 | 291 |
| Slovenia | 171 | 405 | 368 | 161.1 | 275.9 | 26,091 | 300 | 29 | 0.31 | 102 | 5.2 | 476 |
| Somalia | 1 | 60 | 14 | .. | .. | .. | 0 | .. | .. | .. | .. | .. |
| South Africa | 32 | 338 | 127 | .. | 61.8 | 317,298 | 2,400 | 9 | 0.33 | 521 | 8.6 | 256 |
| Spain | 100 | 333 | 591 | 11.8 | 142.9 | 271,837 | 5,388 | 17 | 0.00 | 938 | 5.1 | 731 |
| Sri Lanka | 29 | 208 | 111 | 0.3 | 7.1 | .. | 122 | 6 | 0.05 | 6 | .. | .. |
| Sudan | 26 | 464 | 273 | 0.0 | 3.2 | .. | 30 | 3 | 2.33 | .. | .. | .. |
| Swaziland | 26 | 162 | 119 | .. | .. | .. | 10 | 12 | 0.24 | 1 | .. | .. |
| Sweden | 432 | 932 | 574 | 199.3 | 506.7 | 484,398 | 4,048 | 2 | 21.35 | 1,033 | 10.4 | 2,674 |
| Switzerland | 369 | 1,002 | 548 | 358.1 | 499.7 | 154,413 | 2,134 | .. | 30.87 | 1,079 | 10.3 | 3,482 |
| Syrian Arab Republic | 20 | 276 | 67 | 0.0 | 15.4 | .. | 30 | .. | .. | 1 | .. | .. |
| Tajikistan | 20 | 141 | 326 | .. | .. | .. | 3 | .. | .. | .. | .. | .. |
| Tanzania | 4 | 281 | 20 | .. | 2.8 | .. | 115 | 69 | 0.79 | .. | .. | .. |
| Thailand | 64 | 235 | 284 | 2.5 | 24.3 | 225,832 | 2,300 | 9 | 0.75 | 116 | 3.6 | 71 |
| Togo | 4 | 265 | 32 | .. | 21.6 | .. | 100 | 8 | 0.75 | .. | .. | .. |
| Trinidad and Tobago | 123 | 532 | 340 | .. | 61.8 | .. | 100 | 1 | 0.37 | 12 | .. | .. |
| Tunisia | 31 | 158 | 198 | .. | 22.9 | .. | 100 | 25 | 0.22 | 4 | .. | .. |
| Turkey | 111 | 573 | 449 | 13.4 | 38.1 | 107,991 | 2,000 | 1 | 4.10 | 219 | 4.8 | 149 |
| Turkmenistan | .. | 256 | 196 | .. | .. | .. | 6 | .. | .. | .. | .. | .. |
| Uganda | 2 | 127 | 27 | 0.0 | 2.7 | .. | 40 | 30 | 0.82 | 1 | .. | .. |
| Ukraine | 101 | 889 | 456 | 52.3 | 17.6 | .. | 300 | 7 | 0.04 | 44 | .. | .. |
| United Arab Emirates | 156 | 318 | 292 | .. | 153.5 | .. | 735 | 13 | 0.00 | 31 | .. | .. |
| United Kingdom | 329 | 1,432 | 1 | 56.9 | 337.8 | 1,613,403 | 18,000 | 14 | 0.00 | 6,467 | 9.1 | 2,187 |
| United States | 213 | 2,118 | 854 | 252.1 | 585.2 | 13,426,248 | 95,354 | 5 | 3.50 | 78,126 | 8.1 | 2,926 |
| Uruguay | 293 | 603 | 530 | 125.9 | 104.9 | .. | 370 | .. | .. | 37 | .. | .. |
| Uzbekistan | 3 | 456 | 276 | 3.0 | .. | .. | 120 | 77 | 0.10 | 1 | .. | .. |
| Venezuela, RB | 206 | 294 | 185 | 40.2 | 45.5 | 92,655 | 950 | 27 | .. | 92 | 3.9 | 196 |
| Vietnam | 4 | 109 | 185 | .. | 8.8 | 21,027 | 200 | 20 | 0.25 | 6 | 6.5 | 25 |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | 0.28 | .. | .. | .. |
| Yemen, Rep. | 15 | 65 | 283 | .. | 1.9 | .. | 15 | 45 | 0.09 | .. | .. | .. |
| Yugoslavia, Fed. Rep. | 107 | 297 | 282 | .. | 22.6 | .. | 400 | .. | 0.13 | 7 | .. | .. |
| Zambia | 12 | 145 | 134 | .. | 6.7 | .. | 20 | 19 | 0.31 | .. | .. | .. |
| Zimbabwe | 18 | 362 | 30 | 0.0 | 11.9 | .. | 50 | 46 | 0.34 | 1 | .. | .. |
| World | .. w | 419 w | 254 w | 68.6 w | 78.3 w | 366,470 s | 18 w | 0.34 w | 121,223 s | | | |
| Low income | 42 | 156 | 91 | .. | 5.1 | 9,337 | 33 | 0.35 | 279 | | | |
| Middle income | .. | 362 | 275 | 52.6 | 33.1 | 87,311 | 17 | 0.33 | 5,294 | | | |
| Lower middle income | .. | 330 | 260 | 54.4 | 21.1 | 37,918 | 18 | 0.22 | 1,050 | | | |
| Upper middle income | 91 | 463 | 319 | 46.7 | 69.9 | 49,393 | 15 | 0.40 | 4,244 | | | |
| Low & middle income | .. | 265 | 185 | 42.5 | 20.1 | 96,649 | 23 | 0.34 | 5,573 | | | |
| East Asia & Pacific | .. | 306 | 252 | 52.4 | 21.7 | 51,943 | 20 | 0.20 | 940 | | | |
| Europe & Central Asia | 102 | 448 | 380 | .. | 45.4 | 14,648 | 15 | 0.37 | 1,694 | | | |
| Latin America & Carib. | 71 | 413 | 269 | 20.1 | 43.6 | 19,086 | .. | .. | 2,185 | | | |
| Middle East & N. Africa | 33 | 277 | 172 | .. | 31.2 | 1,864 | 27 | 0.22 | 67 | | | |
| South Asia | 8 | 112 | 75 | 37.8 | 4.2 | 5,413 | 13 | 0.18 | 135 | | | |
| Sub-Saharan Africa | 12 | 198 | 59 | .. | 9.2 | 3,695 | 36 | 0.53 | 552 | | | |
| High income | 285 | 1,280 | 641 | 173.8 | 392.7 | 269,821 | 11 | 1.46 | 115,650 | | | |
| Europe EMU | 209 | 811 | 568 | 127.2 | 267.3 | 65,863 | .. | 13.00 | 11,741 | | | |

a. Data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2001*. Please cite the ITU for third-party use of these data.



About the data

The digital and information revolution has changed the way the world learns, communicates, does business, and treats illnesses. New information and communications technologies offer vast opportunities for progress in all walks of life in all countries—opportunities for economic growth, improved health, better service delivery, learning through distance education, and social and cultural advances.

The table includes indicators of the penetration of the information economy—newspapers, radios, television sets, personal computers, and Internet users—as well as some of the economics of the information age—Internet access charges, the number of secure servers, and spending on information and communications technology.

The data on the number of daily newspapers in circulation and radio receivers in use are from statistical surveys carried out by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). In some countries definitions, classifications, and methods of enumeration do not entirely conform to UNESCO standards. For example, newspaper circulation data should refer to the number of copies distributed, but in some cases the figures reported are the number of copies printed. In addition, many countries impose radio and television license fees to help pay for public broadcasting, discouraging radio and television owners from declaring ownership. Because of these and other data collection problems, estimates of the number of newspapers and radios vary widely in reliability and should be interpreted with caution.

The data for other electronic communications and information technology are from the International Telecommunication Union (ITU), the Internet Software Consortium, Netcraft, and the World Information Technology and Services Alliance. The ITU collects data on television sets and cable television subscribers through annual questionnaires sent to national broadcasting authorities and industry associations. Some countries require that television sets be registered. To the extent that households do not register their televisions or do not register all of their televisions, the data on licensed sets may understate the true number.

Because of different regulatory requirements for the provision of data, complete measurement of the telecommunications sector is not possible. Telecommunications data are compiled through annual questionnaires sent to telecommunications authorities and operating companies. The data are supplemented by annual reports and statistical yearbooks of telecommunications ministries, regulators, operators, and industry associations. In some cases estimates are derived from ITU documents or other references.

The estimates of personal computers are derived from an annual questionnaire, supple-

mented by other sources. In many countries mainframe computers are used extensively, and thousands of users can be connected to a single mainframe computer; thus the number of personal computers understates the total use of computers.

Data on Internet users are based on estimates derived from reported counts of Internet service provider (ISP) subscribers or calculated by multiplying the number of hosts by an estimated multiplier. Internet hosts are computers connected directly to the world-wide network, each allowing many computer users to access the Internet. This method may undercount the number of people actually using the Internet, particularly in developing countries where many commercial subscribers rent computers connected to the Internet. Although survey methods used to estimate the number of Internet hosts have improved in recent years, some measurement problems remain (see Zook 2000). For detailed analysis of Internet trends by country, it is best to use the original source data.

The table shows both the off-peak ISP charge and the telephone usage charge for being logged on to the Internet. Some countries have peak rates that are higher.

The number of secure servers, from the Netcraft Secure Server Survey, gives an indication of how many companies are conducting encrypted transactions over the Internet.

The data on information and communications technology expenditures cover the world's 55 largest buyers of such technology among countries and regions, accounting for 98 percent of global spending.

Definitions

- **Daily newspapers** refer to those published at least four times a week.
- **Radios** refer to radio receivers in use for broadcasts to the general public.
- **Television sets** refer to those in use.
- **Cable television subscribers** are households that subscribe to a multichannel television service delivered by a fixed line connection. Some countries also report subscribers to pay television using wireless technology or those cabled to community antenna systems.
- **Personal computers** are self-contained computers designed to be used by a single individual.
- **Personal computers installed in education** include PC shipments installed in education establishments, whether primary or secondary schools or universities.
- **Internet users** are people with access to the worldwide network.
- **Internet service provider charge** shows the costs associated with 30 off-peak hours of dial-up Internet access per month. It is the monthly Internet subscription rate plus extra charges once free hours have been used up. Some countries have peak rates that are higher.
- **Telephone usage charge** refers to the amount payable to the telephone company for 30 off-peak hours of local telephone use while logged on to the Internet. Excluded is the monthly telephone line tariff. If a special Internet telephone tariff exists, it is used instead. Some countries have peak rates that are higher.
- **Secure servers** are servers using encryption technology in Internet transactions.
- **Information and communications technology expenditures** include external spending on information technology (“tangible” spending on information technology products purchased by businesses, households, governments, and education institutions from vendors or organizations outside the purchasing entity), internal spending on information technology (“intangible” spending on internally customized software, capital depreciation, and the like), and spending on telecommunications and other office equipment.

Data sources

The data on newspapers and radios are compiled by UNESCO's Institute for Statistics. The data on television sets, cable television subscribers, personal computers, Internet users, and Internet access charges are from the ITU. They are reported in the ITU's *World Telecommunication Development Report 2001, Challenges to the Network: Internet for Development* (1999), and the *World Telecommunications Indicators Database* (2000b). The data on secure servers are from Netcraft (www.netcraft.com/). The data on PCs installed in education and on information and communications technology expenditures are from *Digital Planet 2002: The Global Information Economy* by the World Information Technology and Services Alliance (WITSA), which uses data from the International Data Corporation.



5.11 | Science and technology

| | Scientists and engineers in R&D | Technicians in R&D | Science and engineering students | Science and technical journal articles | Expenditures for R&D | High-technology exports | | Royalty and license fees | | Patent applications filed ^a | | Trademark applications filed ^b |
|--------------------------|----------------------------------------------|----------------------------------------------|--------------------------------------------------------------|----------------------------------------|------------------------------------|-------------------------|-----------------------------------|------------------------------|------------------------------|----------------------------------------|-----------------------|-------------------------------------------|
| | per million people 1990-2000 ^c | per million people 1990-2000 ^c | % of total tertiary level students 1987-1997 ^c | 1997 | % of GNI 1989-2000 ^c | \$ millions 2000 | % of manufactured exports 2000 | Receipts \$ millions 2000 | Payments \$ millions 2000 | Residents 1999 | Non-residents 1999 | Total 1999 |
| Afghanistan | .. | .. | 10 | 0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Albania | .. | .. | 19 | 10 | .. | 2 | 1 | .. | .. | 0 | 89,519 | 2,035 |
| Algeria | .. | .. | 58 | 139 | .. | 15 | 4 | .. | .. | 34 | 248 | 4,252 |
| Angola | .. | .. | 24 | 2 | .. | .. | .. | 3 | 2 | .. | .. | .. |
| Argentina | 711 | 156 | 28 | 2,119 | 0.48 | 767 | 9 | 13 | 458 | 899 | 5,558 | 65,243 |
| Armenia | 1,308 | 238 | 29 | 178 | 0.18 | 4 | 5 | .. | .. | 109 | 40,163 | 3,273 |
| Australia | 3,320 | 792 | 24 | 11,793 | 1.71 | 2,734 | 15 | 343 | 999 | 9,537 | 53,818 | 58,789 |
| Austria | 1,605 | 801 | 33 | 3,432 | 1.64 | 6,600 | 14 | 162 | 547 | 3,075 | 159,046 | 18,697 |
| Azerbaijan | 2,735 | 184 | 37 | 71 | .. | 6 | 4 | .. | .. | 0 | 40,042 | 2,091 |
| Bangladesh | 51 | 32 | 47 | 130 | .. | 4 | 0 | 0 | 4 | 32 | 184 | .. |
| Belarus | 2,296 | 271 | 48 | 548 | 0.57 | 180 | 4 | 1 | 2 | 1,002 | 40,790 | 5,511 |
| Belgium | 2,307 | 2,195 | 41 | 4,717 | 1.55 | 15,274 | 10 | 783 | 900 | 1,786 | 119,195 | .. |
| Benin | 174 | 53 | 18 | 19 | .. | 0 | 0 | .. | 1 | .. | .. | .. |
| Bolivia | 171 | 154 | 30 | 27 | .. | 158 | .. | 2 | 5 | .. | .. | .. |
| Bosnia and Herzegovina | .. | .. | .. | 8 | .. | .. | .. | .. | .. | 23 | 41,201 | 4,009 |
| Botswana | .. | .. | 37 | 33 | .. | .. | .. | 0 | 6 | 0 | 54 | .. |
| Brazil | 168 | 58 | 27 | 3,908 | 0.77 | 5,979 | 19 | 126 | 1,415 | 1,957 | 50,338 | .. |
| Bulgaria | 1,289 | 466 | 27 | 896 | 0.00 | .. | .. | 4 | 10 | 302 | 42,650 | 8,776 |
| Burkina Faso | 17 | 16 | 18 | 20 | .. | .. | .. | .. | .. | .. | .. | .. |
| Burundi | 21 | 32 | 20 | 11 | 0.31 | .. | .. | 0 | 0 | .. | .. | .. |
| Cambodia | .. | .. | 13 | 3 | .. | .. | .. | .. | .. | .. | .. | 1,303 |
| Cameroon | .. | .. | 45 | 73 | .. | 1 | 1 | .. | .. | .. | .. | .. |
| Canada | 3,009 | 1,171 | 16 | 19,910 | 1.68 | 32,702 | 19 | 1,374 | 3,267 | 5,197 | 64,580 | 40,365 |
| Central African Republic | 47 | 27 | 30 | 5 | 0.02 | .. | .. | .. | .. | .. | .. | .. |
| Chad | .. | .. | 14 | 2 | .. | .. | .. | .. | .. | .. | .. | .. |
| Chile | 370 | .. | 42 | 850 | 0.56 | 100 | 3 | 102 | 44 | .. | .. | .. |
| China | 459 | 187 | 43 | 9,081 | 0.06 | 40,837 | 19 | 80 | 1,281 | 146 | 52,202 | 165,122 |
| Hong Kong, China | 93 | 100 | 36 | 2,080 | .. | 5,155 | 23 | .. | .. | 42 | 5,998 | 19,885 |
| Colombia | .. | .. | 28 | 208 | .. | 328 | 7 | 4 | 71 | 68 | 1,615 | 12,788 |
| Congo, Dem. Rep. | .. | .. | .. | 15 | .. | .. | .. | .. | .. | .. | .. | .. |
| Congo, Rep. | 34 | 37 | 48 | 8 | .. | .. | .. | .. | .. | .. | .. | .. |
| Costa Rica | 533 | .. | 20 | 73 | 0.06 | 1,856 | .. | 1 | 31 | 0 | 9,105 | .. |
| Côte d'Ivoire | .. | .. | 31 | 31 | .. | .. | .. | 0 | 11 | .. | .. | .. |
| Croatia | 1,494 | 708 | 30 | 544 | 1.18 | 272 | 8 | .. | .. | 267 | 40,012 | 6,497 |
| Cuba | 1,611 | 1,121 | 16 | 148 | .. | .. | .. | .. | .. | 111 | 40,928 | 4,307 |
| Czech Republic | 1,317 | 682 | 28 | 2,024 | 1.27 | 2,089 | 8 | 44 | 82 | 618 | 44,691 | 17,923 |
| Denmark | 3,240 | 2,643 | 25 | 3,950 | 1.94 | 6,527 | 21 | .. | .. | 3,339 | 158,225 | 11,537 |
| Dominican Republic | .. | .. | 35 | 6 | .. | .. | .. | .. | 30 | .. | .. | .. |
| Ecuador | 140 | 17 | 27 | 39 | .. | 27 | 6 | .. | 62 | 15 | 475 | .. |
| Egypt, Arab Rep. | 493 | 366 | 12 | 1,108 | 1.93 | 3 | 0 | 59 | 401 | 536 | 1,146 | 3,009 |
| El Salvador | 19 | 303 | 59 | 3 | 2.20 | 39 | 6 | 2 | 20 | .. | .. | .. |
| Eritrea | .. | .. | 30 | 0 | .. | .. | .. | .. | .. | .. | .. | .. |
| Estonia | 2,164 | 540 | 27 | 222 | 0.78 | 830 | 30 | 2 | 8 | 14 | 41,742 | 4,660 |
| Ethiopia | .. | .. | 26 | 103 | .. | 0 | 0 | .. | 0 | 0 | 12 | .. |
| Finland | .. | .. | 39 | 3,897 | .. | 10,532 | 27 | 1,138 | 547 | 2,644 | 156,389 | 9,464 |
| France | 2,686 | 2,878 | 37 | 26,509 | 2.21 | 59,397 | 24 | 2,310 | 2,051 | 20,998 | 117,457 | 100,560 |
| Gabon | .. | .. | 29 | 16 | .. | .. | .. | .. | .. | .. | .. | .. |
| Gambia, The | .. | .. | .. | 25 | .. | 0 | 17 | .. | .. | 0 | 79,703 | .. |
| Georgia | .. | .. | 39 | 128 | .. | .. | .. | .. | .. | 273 | 41,687 | 2,574 |
| Germany | 2,873 | 1,362 | 47 | 36,233 | 2.31 | 82,958 | 18 | 2,821 | 5,454 | 74,232 | 146,529 | 85,770 |
| Ghana | .. | .. | 32 | 78 | .. | 32 | 14 | .. | 0 | 0 | 80,028 | .. |
| Greece | 1,045 | 314 | 26 | 2,123 | 0.48 | 452 | 9 | 5 | 203 | 72 | 119,702 | 8,714 |
| Guatemala | .. | .. | .. | 15 | 0.16 | 68 | 8 | .. | .. | 7 | 224 | 8,953 |
| Guinea | .. | .. | 34 | 3 | .. | .. | .. | .. | 0 | .. | .. | .. |
| Guinea-Bissau | .. | .. | 0 | 3 | .. | .. | .. | .. | .. | 0 | 1 | .. |
| Haiti | .. | .. | .. | 2 | .. | .. | .. | .. | .. | 1 | 5 | 1,456 |
| Honduras | .. | .. | 24 | 10 | .. | 6 | 2 | 0 | 10 | 8 | 148 | 5,045 |



| | Scientists and engineers in R&D | Technicians in R&D | Science and engineering students | Science and technical journal articles | Expenditures for R&D | High-technology exports | | Royalty and license fees | | Patent applications filed ^a | | Trademark applications filed ^b |
|--------------------|----------------------------------------------|----------------------------------------------|--------------------------------------------------------------|----------------------------------------|------------------------------------|-------------------------|-----------------------------------|------------------------------|------------------------------|----------------------------------------|-----------------------|-------------------------------------------|
| | per million people 1990-2000 ^c | per million people 1990-2000 ^c | % of total tertiary level students 1987-1997 ^c | 1997 | % of GNI 1989-2000 ^c | \$ millions 2000 | % of manufactured exports 2000 | Receipts \$ millions 2000 | Payments \$ millions 2000 | Residents 1999 | Non-residents 1999 | Total 1999 |
| Hungary | 1,249 | 485 | 32 | 1,717 | 0.71 | 6,402 | 26 | 112 | 257 | 787 | 44,187 | 13,862 |
| India | 158 | 115 | 25 | 8,439 | 0.62 | 1,245 | 4 | 83 | 306 | 14 | 38,348 | 66,378 |
| Indonesia | .. | .. | 39 | 123 | 0.07 | 5,698 | 16 | .. | .. | 0 | 42,503 | .. |
| Iran, Islamic Rep. | 590 | 174 | 39 | 332 | 0.49 | 38 | 2 | 0 | 0 | 366 | 177 | .. |
| Iraq | .. | .. | 41 | 35 | .. | .. | .. | .. | .. | .. | .. | .. |
| Ireland | 2,132 | 589 | 31 | 1,118 | 1.54 | 31,278 | 48 | 504 | 7,899 | 1,226 | 119,569 | 4,518 |
| Israel | 1,570 | 518 | 49 | 5,321 | 3.69 | 7,418 | 25 | 500 | 349 | 2,728 | 46,686 | 8,759 |
| Italy | 1,322 | 806 | 30 | 16,405 | 1.04 | 19,306 | 9 | 563 | 1,198 | 9,613 | 118,647 | 44,906 |
| Jamaica | .. | .. | 64 | 49 | .. | 1 | 0 | 6 | 41 | .. | .. | .. |
| Japan | 4,960 | 663 | 21 | 43,891 | 2.80 | 127,368 | 28 | 10,227 | 11,007 | 361,094 | 81,151 | 121,861 |
| Jordan | .. | .. | 26 | 177 | .. | 53 | 8 | .. | .. | 0 | 0 | .. |
| Kazakhstan | .. | .. | 20 | 119 | 0.33 | 183 | 10 | 0 | 11 | 1,358 | 40,470 | 3,898 |
| Kenya | .. | .. | 19 | 235 | .. | 13 | 4 | 7 | 77 | 28 | 80,516 | 2,705 |
| Korea, Dem. Rep. | .. | .. | .. | 0 | .. | .. | .. | .. | .. | 0 | 40,391 | 2,188 |
| Korea, Rep. | 2,139 | 574 | 32 | 4,619 | 2.70 | 53,950 | 35 | 688 | 3,221 | 56,214 | 76,913 | 87,332 |
| Kuwait | 214 | 65 | 29 | 173 | .. | 35 | 1 | 0 | 0 | .. | .. | .. |
| Kyrgyz Republic | 574 | 48 | 14 | 9 | 0.20 | 5 | 5 | 1 | 1 | 60 | 40,131 | 2,428 |
| Lao PDR | .. | .. | 20 | 2 | .. | .. | .. | .. | .. | .. | .. | 609 |
| Latvia | 1,090 | 301 | 23 | 141 | 0.40 | 42 | 4 | 2 | 12 | 94 | 90,182 | 5,959 |
| Lebanon | .. | .. | 30 | 81 | .. | .. | .. | .. | .. | .. | .. | .. |
| Lesotho | .. | .. | 19 | 2 | .. | .. | .. | 12 | 0 | 0 | 80,315 | 9 |
| Liberia | .. | .. | 18 | 1 | .. | .. | .. | .. | .. | 0 | 41,120 | 1,216 |
| Libya | 361 | 493 | .. | 12 | .. | .. | .. | .. | .. | .. | .. | .. |
| Lithuania | 2,031 | 632 | 31 | 198 | .. | 95 | 4 | 0 | 12 | 86 | 90,331 | 6,284 |
| Macedonia, FYR | 387 | 29 | 47 | 49 | 0.35 | 7 | 1 | 3 | 6 | 64 | 89,361 | 3,921 |
| Madagascar | 12 | 37 | 25 | .. | 0.18 | 4 | 3 | 1 | 11 | 9 | 41,237 | 510 |
| Malawi | .. | .. | 27 | 38 | .. | .. | .. | .. | .. | 1 | 80,430 | 665 |
| Malaysia | 154 | 44 | 27 | 304 | 0.42 | 39,964 | 59 | 0 | 0 | 179 | 6,272 | .. |
| Mali | .. | .. | 12 | 12 | .. | .. | .. | .. | .. | .. | .. | .. |
| Mauritania | .. | .. | 41 | 2 | .. | .. | .. | 0 | 0 | .. | .. | .. |
| Mauritius | 360 | 157 | 14 | 2 | 0.17 | 12 | 1 | 0 | 1 | 3 | 12 | .. |
| Mexico | 213 | 73 | 32 | 1,915 | 0.36 | 31,053 | 22 | 43 | 407 | 468 | 49,532 | 46,146 |
| Moldova | 334 | 1,665 | 52 | 111 | 0.79 | 5 | 3 | 1 | 2 | 256 | 40,199 | 3,290 |
| Mongolia | 468 | 92 | 24 | 13 | 0.07 | .. | .. | 1 | .. | 0 | 41,240 | 2,800 |
| Morocco | .. | .. | 41 | 271 | .. | 604 | 12 | 38 | 210 | 0 | 3,649 | 3,281 |
| Mozambique | .. | .. | 42 | 9 | .. | 1 | 2 | .. | 0 | .. | .. | 1,308 |
| Myanmar | .. | .. | 56 | 3 | .. | .. | .. | 0 | 0 | .. | .. | .. |
| Namibia | .. | .. | 4 | 7 | .. | .. | .. | 6 | 3 | .. | .. | .. |
| Nepal | .. | .. | 13 | 35 | .. | 0 | 0 | .. | .. | .. | .. | .. |
| Netherlands | 2,490 | 1,464 | 39 | 11,008 | 2.01 | 44,439 | 35 | 2,176 | 2,565 | 6,395 | 117,118 | .. |
| New Zealand | 2,197 | 732 | 20 | 2,308 | 1.21 | 365 | 10 | 49 | 308 | 1,650 | 45,990 | 16,576 |
| Nicaragua | .. | .. | 33 | 11 | .. | 2 | 5 | .. | .. | 9 | 136 | .. |
| Niger | .. | .. | 32 | 25 | .. | 0 | 5 | .. | .. | .. | .. | .. |
| Nigeria | .. | .. | 42 | 405 | .. | 17 | 13 | .. | .. | .. | .. | .. |
| Norway | 4,095 | 1,836 | 26 | 2,501 | 1.68 | 1,895 | 17 | 131 | 391 | 1,731 | 48,931 | 13,588 |
| Oman | .. | .. | 13 | 53 | .. | 43 | 4 | .. | .. | .. | .. | .. |
| Pakistan | 78 | 14 | 32 | 232 | .. | 30 | 0 | 6 | 28 | .. | .. | 7,762 |
| Panama | .. | .. | 29 | 37 | .. | 0 | 0 | 0 | 30 | .. | .. | .. |
| Papua New Guinea | .. | .. | 10 | 31 | .. | 34 | 42 | .. | .. | .. | .. | .. |
| Paraguay | .. | .. | 20 | 4 | .. | 5 | 3 | 203 | 2 | .. | .. | .. |
| Peru | 229 | 1 | 34 | 63 | 0.00 | 35 | 3 | 0 | 57 | 48 | 944 | .. |
| Philippines | 156 | 22 | 14 | 159 | 0.21 | 8,465 | 59 | 7 | 197 | 144 | 3,217 | 10,070 |
| Poland | 1,460 | 463 | 28 | 4,019 | 0.73 | 838 | 3 | 34 | 554 | 2,286 | 45,194 | 25,054 |
| Portugal | 1,583 | 166 | 36 | 1,085 | 0.63 | 1,045 | 5 | 21 | 255 | 133 | 159,533 | 15,782 |
| Puerto Rico | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Romania | 1,393 | 584 | 21 | 751 | 0.79 | 445 | 6 | 3 | 45 | 1,069 | 90,235 | 9,060 |
| Russian Federation | 3,397 | 550 | 50 | 17,147 | 1.08 | 3,082 | 14 | 91 | 31 | 20,131 | 47,745 | 28,966 |



5.11 | Science and technology

| | Scientists and engineers in R&D | Technicians in R&D | Science and engineering students | Science and technical journal articles | Expenditures for R&D | High-technology exports | | Royalty and license fees | | Patent applications filed ^a | | Trademark applications filed ^b |
|--------------------------------|----------------------------------------------|----------------------------------------------|--------------------------------------------------------------|----------------------------------------|------------------------------------|-------------------------|-----------------------------------|------------------------------|------------------------------|----------------------------------------|-----------------------|-------------------------------------------|
| | per million people 1990-2000 ^c | per million people 1990-2000 ^c | % of total tertiary level students 1987-1997 ^c | 1997 | % of GNI 1989-2000 ^c | \$ millions 2000 | % of manufactured exports 2000 | Receipts \$ millions 2000 | Payments \$ millions 2000 | Residents 1999 | Non-residents 1999 | Total 1999 |
| Rwanda | .. | 6 | 28 | 5 | .. | .. | .. | 0 | 1 | 0 | 4 | 129 |
| Saudi Arabia | .. | .. | 17 | 613 | .. | 22 | 0 | 0 | 0 | 72 | 1,144 | .. |
| Senegal | 2 | 3 | 21 | 58 | .. | 34 | 13 | 2 | 5 | .. | .. | .. |
| Sierra Leone | .. | .. | 17 | 8 | .. | .. | .. | .. | .. | 0 | 72,449 | 1,112 |
| Singapore | 2,182 | 283 | .. | 1,164 | 1.13 | 73,643 | 63 | .. | .. | 374 | 51,121 | 15,753 |
| Slovak Republic | 1,706 | 790 | 40 | 950 | 0.98 | 382 | 4 | 16 | 58 | 222 | 42,857 | 9,913 |
| Slovenia | 2,161 | 877 | 26 | 517 | 1.47 | 368 | 5 | 12 | 49 | 292 | 90,680 | 7,420 |
| Somalia | .. | .. | 18 | 1 | .. | .. | .. | .. | .. | .. | .. | .. |
| South Africa | 992 | 303 | 29 | 1,927 | 0.62 | 21 | 1 | 62 | 142 | 116 | 26,354 | .. |
| Spain | 1,562 | 456 | 31 | 11,210 | 0.84 | 6,727 | 8 | 403 | 1,681 | 3,394 | 159,696 | 85,742 |
| Sri Lanka | 188 | 45 | 34 | 61 | .. | 109 | 3 | .. | .. | 0 | 41,263 | .. |
| Sudan | .. | .. | 16 | 43 | .. | 0 | 0 | 0 | 0 | 2 | 80,424 | 1,281 |
| Swaziland | .. | .. | 17 | 6 | .. | .. | .. | 0 | 36 | 0 | 40,673 | 872 |
| Sweden | 4,507 | 404 | 38 | 8,219 | 3.76 | 25,739 | 22 | 1,275 | 900 | 9,122 | 155,929 | 15,562 |
| Switzerland | 3,058 | 1,399 | 34 | 6,935 | 2.55 | 14,260 | 19 | .. | .. | 6,412 | 155,991 | 11,061 |
| Syrian Arab Republic | 29 | 24 | 23 | 57 | .. | 2 | 1 | .. | .. | .. | .. | .. |
| Tajikistan | 660 | .. | 17 | 29 | .. | .. | .. | .. | .. | 38 | 40,103 | 2,270 |
| Tanzania | .. | .. | 37 | 89 | .. | 6 | 6 | 0 | 4 | 0 | 14,467 | 2 |
| Thailand | 102 | 75 | 18 | 356 | 0.10 | 13,949 | 32 | 9 | 710 | 477 | 4,594 | 22,439 |
| Togo | 102 | 65 | 35 | 7 | .. | 0 | 0 | 0 | 1 | .. | .. | .. |
| Trinidad and Tobago | 145 | 258 | 58 | 41 | 0.14 | 11 | 1 | 0 | 0 | 0 | 41,238 | 1,196 |
| Tunisia | 124 | 57 | 33 | 188 | 0.30 | 124 | 3 | 9 | 3 | .. | .. | .. |
| Turkey | 303 | 38 | 45 | 2,116 | 0.48 | 1,084 | 5 | .. | .. | 325 | 43,508 | 26,372 |
| Turkmenistan | .. | .. | .. | 7 | .. | 8 | 5 | .. | .. | 44 | 40,070 | 742 |
| Uganda | 25 | 15 | 17 | 46 | 0.76 | 2 | 10 | .. | 0 | 0 | 80,421 | .. |
| Ukraine | 2,121 | 595 | 42 | 2,163 | 0.97 | .. | .. | 1 | 663 | 5,415 | 42,858 | 9,578 |
| United Arab Emirates | .. | .. | 24 | 127 | .. | .. | .. | .. | .. | 0 | 24,218 | .. |
| United Kingdom | 2,678 | 1,014 | 34 | 38,530 | 1.81 | 72,616 | 32 | 7,361 | 6,126 | 31,326 | 161,549 | 70,880 |
| United States | 4,103 | .. | 19 | 166,829 | 2.55 | 197,033 | 34 | 38,030 | 16,100 | 156,393 | 138,313 | 260,766 |
| Uruguay | .. | .. | 32 | 110 | .. | 20 | 2 | 0 | 11 | 27 | 525 | 9,741 |
| Uzbekistan | 1,754 | 312 | .. | 261 | .. | .. | .. | .. | .. | 769 | 41,596 | 3,256 |
| Venezuela, RB | 194 | 32 | 26 | 429 | 0.34 | 80 | 3 | 0 | 0 | 201 | 2,323 | .. |
| Vietnam | 274 | .. | .. | 106 | .. | .. | .. | .. | .. | 37 | 42,175 | 6,518 |
| West Bank and Gaza | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yemen, Rep. | .. | .. | 5 | 10 | .. | .. | 0 | .. | .. | .. | .. | .. |
| Yugoslavia, Fed. Rep. | 2,389 | 515 | 47 | 492 | 1.34 | .. | .. | .. | .. | 340 | 41,744 | 5,336 |
| Zambia | .. | .. | 16 | 23 | .. | .. | .. | .. | .. | 5 | 87 | 959 |
| Zimbabwe | .. | .. | 24 | 100 | .. | 9 | 2 | .. | .. | 1 | 80,167 | 14 |
| World | .. w | .. w | 35 w | 512,637 s | 2.12 w | 1,003,791 s | 20 w | 72,194 s | 74,051 s | 810,407 s | 6,177,807 s | |
| Low income | .. | .. | 28 | 13,565 | .. | 5,766 | 7 | 105 | 1,108 | 7,027 | 1,342,958 | |
| Middle income | 818 | 255 | 39 | 61,733 | .. | 150,982 | 16 | 1,768 | 9,956 | 90,268 | 1,578,263 | |
| Lower middle income | 787 | 229 | 41 | 32,967 | .. | 45,591 | 14 | 526 | 3,265 | 25,996 | 931,209 | |
| Upper middle income | 593 | 218 | 33 | 28,767 | 0.99 | 105,391 | 17 | 1,242 | 6,691 | 64,272 | 647,054 | |
| Low & middle income | .. | .. | 35 | 75,298 | .. | 156,748 | 16 | 1,873 | 11,064 | 97,295 | 2,921,221 | |
| East Asia & Pacific | 496 | 193 | 43 | 14,817 | 0.88 | 100,485 | 25 | 784 | 5,409 | 56,541 | 298,643 | |
| Europe & Central Asia | 2,212 | 478 | 44 | 34,905 | 0.83 | 15,567 | 10 | 313 | 1,753 | 35,952 | 1,373,268 | |
| Latin America & Carib. | 287 | .. | 30 | 10,075 | 0.58 | 40,497 | 16 | 501 | 2,666 | 3,618 | 284,873 | |
| Middle East & N. Africa | .. | .. | 29 | 3,106 | .. | .. | 1 | 106 | 614 | 1,008 | 6,364 | |
| South Asia | 158 | 114 | 24 | 8,896 | 0.62 | .. | 3 | 87 | 338 | 14 | 79,611 | |
| Sub-Saharan Africa | .. | .. | 29 | 3,499 | .. | .. | 8 | 82 | 283 | 162 | 878,462 | |
| High income | 3,344 | .. | 25 | 437,339 | 2.30 | 847,043 | 22 | 70,321 | 62,988 | 713,112 | 3,256,586 | |
| Europe EMU | 2,141 | 951 | 38 | 117,764 | 1.97 | 277,585 | 16 | 11,019 | 23,422 | 123,795 | 1,652,255 | |

a. Other patent applications filed in 1999 include those filed under the auspices of the African Intellectual Property Organization (30 by residents, 41,068 by non-residents, African Regional Industrial Property Organization (7 by residents, 40,720 by non-residents), European Patent Office (55,947 by residents, 65,869 by non-residents) and Eurasian Patent Organization (366 by residents, 41,476 by non-residents). The original information was provided by the World Intellectual Property Organization (WIPO). The International Bureau of WIPO assumes no liability or responsibility with respect to the transformation of these data. b. Other trademark applications filed in 1999 include those filed under the auspices of the African Intellectual Property Organization (1730), African Regional Industrial Property Organization (15), and the Office for Harmonization in the Internal Market (41,255). The original information was provided by the World Intellectual Property Organization (WIPO). The International Bureau of WIPO assumes no liability or responsibility with respect to the transformation of these data. c. Data are for the latest year available; see *Primary data documentation* for the year.



About the data

Technological innovation, often fueled by government-led research and development (R&D), has been the driving force for industrial growth around the world. The best opportunities to improve living standards—including new ways of reducing poverty—will come from science and technology.

Science is advancing rapidly in virtually all fields, particularly biotechnology, and playing a growing economic role: countries unable to access, generate, and apply relevant scientific knowledge will fall even further behind. And there is greater appreciation of the need for high-quality scientific input into public policy issues such as regional and global environmental concerns.

Science and technology cover a range of issues too complex and too broad to be quantified by any single set of indicators, but those in the table shed light on countries' "technological base"—the availability of skilled human resources, the number of scientific and technical articles published, the competitive edge countries enjoy in high-technology exports, sales and purchases of technology through royalties and licenses, the number of patent applications filed, and trademarks issued.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) collects data on scientific and technical workers and R&D expenditures from member states, mainly through questionnaires and special surveys as well as from official reports and publications, supplemented by information from other national and international sources. UNESCO reports either the stock of scientists, engineers, and technicians or the number of economically active persons qualified in those fields. UNESCO supplements these data with estimates of the number of qualified scientists and engineers by counting the number of people who have completed education at ISCED (International Standard Classification of Education) levels 6 and 7; qualified technicians are estimated using the number of people who have completed education at ISCED level 5. The data are normally calculated in terms of full-time-equivalent staff, the quality of whose training and education varies widely. Similarly, R&D expenditures are no guarantee of progress; governments need to pay close attention to the practices that make them effective.

The data on science and engineering students refer to those enrolled at the tertiary level, normally after their successful completion of education at the secondary level. These data are reported to UNESCO by national education authorities. (For further details on UNESCO education surveys see *About the data* for table 2.12.)

The methodology used for determining a country's high-technology exports was developed by the Organisation for Economic Co-operation and Development in collaboration with Eurostat. Termed the "product approach" to distinguish it from a "sectoral approach," the method is based on the calculation of R&D intensity (R&D expendi-

ture divided by total sales) for groups of products from six countries (Germany, Italy, Japan, the Netherlands, Sweden, and the United States). Because industrial sectors characterized by a few high-technology products may also produce many low-technology products, the product approach is more appropriate for analyzing international trade than is the sectoral approach. To construct a list of high-technology manufactured products (services are excluded), the R&D intensity was calculated for products classified at the three-digit level of the Standard International Trade Classification revision 3. The final list was determined at the four- and five-digit levels. At these levels, since no R&D data were available, final selection was based on patent data and expert opinion. This methodology takes only R&D intensity into account. Other characteristics of high technology are also important, such as know-how, scientific and technical personnel, and technology embodied in patents; considering these characteristics would result in a different list. (See Hatzichronoglou 1997 for further details.) Note that the R&D for high-technology exports may not have occurred in the reporting country.

The counts of scientific and technical journal articles include those published in a stable set of about 5,000 of the world's most influential scientific and technical journals, tracked since 1985 by the Institute of Scientific Information's Science Citation Index (SCI) and Social Science Citation Index (SSCI). (See *Definitions* for the fields covered.) The SCI and SSCI databases cover the core set of scientific journals but may exclude some of regional or local importance. They may also reflect some bias toward English-language journals.

Most countries have adopted systems that protect patentable inventions. Under most patent legislation, to be protected by law (patentable), an idea must be new in the sense that it has not already been published or publicly used; it must be nonobvious (involve an inventive step), in the sense that it would not have occurred to any specialist in the industrial field had such a specialist been asked to find a solution to the problem; and it must be capable of industrial application, in the sense that it can be industrially manufactured or used. Information on patent applications filed is shown separately for residents and non-residents of the country. The World Intellectual Property Organization estimates that at the end of 1998 about 4 million patents were in force in the world.

A trademark provides protection to owner by ensuring the exclusive right to use it to identify goods or services or to authorize another to use it in return for payment. The period of protection varies, but a trademark can be renewed indefinitely beyond the time limit on payment of additional fees. The system helps consumers identify and purchase a product or service because its nature and quality, indicated by its unique trademark, meets their needs.

Definitions

- **Scientists and engineers in R&D** are people trained at the tertiary level to work in any field of science who are engaged in professional R&D activity.
- **Technicians in R&D** are people engaged in professional R&D activity who have received vocational or technical training in any branch of knowledge or technology. Most such jobs require three years beyond the first stage of secondary education.
- **Science and engineering students** include students at the tertiary level in the following fields: engineering, natural science, mathematics and computers, and social and behavioral sciences.
- **Scientific and technical journal articles** refer to scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, bio-medical research, engineering and technology, and earth and space sciences.
- **Expenditures for R&D** are current and capital expenditures on creative, systematic activity that increases the stock of knowledge. Included are fundamental and applied research and experimental development work leading to new devices, products, or processes.
- **High-technology exports** are products with high R&D intensity. They include high-technology products such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.
- **Royalty and license fees** are payments and receipts between residents and nonresidents for the authorized use of intangible, non-produced, non-financial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes, and franchises) and for the use, through licensing agreements, of produced originals of prototypes (such as manuscripts and films).
- **Patent applications filed** are applications filed with a national patent office for exclusive rights for an invention—a product or process that provides a new way of doing something or offers a new technical solution to a problem. A patent provides protection for the invention to the owner of the patent for a limited period, generally 20 years.
- **Trademarks** are distinctive signs that identify certain goods or services as those produced or provided by a specific person or enterprise.

Data sources

The data on technical personnel, science and engineering students, and R&D expenditures are from UNESCO's *Statistical Yearbook*. The data on scientific and technical journal articles are from the National Science Foundation's *Science and Engineering Indicators 2000*. The information on high-technology exports is from the United Nations' Commodity Trade (COMTRADE) database. The data on royalty and license fees are from the International Monetary Fund's *Balance of Payments Statistics Yearbook*, and the data on patents and trademarks are from the World Intellectual Property Organization's *Industrial Property Statistics*.