5 STATES AND MARKETS

Successful development requires that states complement markets, not substitute for them. States should focus on providing a good business environment—in which contracts are enforced, markets function, basic infrastructure is provided, and people (especially poor people) are empowered to participate. Government institutions can support the development of markets in many ways—by providing information, fostering competition, enforcing contracts, and helping to make credit available to entrepreneurs. By leveling the playing field, governments create opportunities for poor people to participate in markets and improve their standards of living and give them hope for a better future for their children.

Good governance matters for long-term growth, but good policies and effective government spending also have immediate effects on people. Many governments are working with service providers and beneficiaries to improve public service delivery. For example, in Bangalore, India, a civil society group introduced report cards in 1994 rating user experiences with public services. The reports of poor quality and corruption were widely publicized, leading to improvements in service delivery and public governance.

This section covers a broad range of indicators showing how effective and accountable government, together with energetic private initiative, produces employment opportunities and services that empower poor people. Its 12 tables cover three cross-cutting development themes: private sector development, public sector policies, and infrastructure, information, and telecommunications.

Creating the conditions for private sector development

Investment is the foundation of growth, and most investment comes from the private sector. But governments play an important role in providing a predictable environment in which people, ideas, and money work together productively and efficiently. This allows private firms operating in competitive markets to be the engines of growth and job creation, providing opportunities to escape poverty.

Governments around the world are expanding opportunities for improved investment and business climates. State-owned enterprises are being privatized, trade barriers are being reduced, and improvements in regulations that enhance business activity are contributing to greater business opportunities and growth.

Investment in infrastructure—whether in power, transport, housing, telecommunications, or water and sanitation—enables businesses to grow. And when private firms participate in infrastructure, bringing with them capital and know-how, they can improve access to basic infrastructure services, a key to reducing poverty.

In developing countries private firms participate mainly in telecommunications and energy, and in many countries investment has been robust. In Chile in 1990–95 investment in telecommunications projects with private participation totaled about $150 million, but in 1996–2002 it increased tenfold, to almost $1,600 million. India also saw a dramatic increase in private participation in energy investment, which soared from $2,888 million in 1990–95 to $9,680 million in 1996–2002. Substantial increases in investment with private participation have also occurred in water and sanitation. In China these investments rose from $68 million in 1990–95 to $3,886 million in 1996–2002 (table 5.1).

The case for creating a good investment climate (sound macroeconomic framework, and legal and regulatory framework, good governance to overcome bureaucratic inefficiencies, and access to key financial and infrastructure services) is simple: an economy needs a predictable environment in which people, ideas, and money can work together productively and efficiently. In the context of a sound macroeconomic framework, a good investment climate strengthens governance and overcomes bureaucratic inefficiencies, improves access to key financial and infrastructure services, and provides a sound legal and regulatory framework for enterprises that promotes competition. Countries should focus on improving the investment climate for domestic entrepreneurs, but a better investment climate will also attract foreign investors. And countries that receive more foreign investment—an important conduit for new technologies, management experience, and access to markets—enjoy faster growth and greater poverty reduction.

External perceptions of the investment climate are reflected in risk ratings, and changes in sovereign risk ratings may affect country risk and stock returns. One example is the Euromoney creditworthiness ratings, which rank the risk of investing in an economy from 0 (high risk) to 100 (low risk). Although many factors determine the level of foreign investment, countries with high risk, such as the Democratic Republic of Congo, at 18, and Haiti, at 24, have very low foreign direct investment—0.6 percent of gross domestic product (GDP) for the Democratic Republic of Congo and 0.2 percent for Haiti. Countries with low perceived risk, such as the Czech Republic, at 66, and Slovenia, at 76, have much higher levels of foreign direct investment—13.4 percent for the Czech Republic and about 8.5 percent for Slovenia (see table 5.1 for data on foreign direct investment and table 5.2 for credit and risk ratings). Countries with low perceived risk also have large stock markets relative to their GDP. Market capitalization is about 74 percent of GDP in Chile, 93 percent in Australia, and 131 percent in Malaysia (table 5.4).

The World Bank's *Doing Business* database identifies regulations that enhance or constrain business investment, productivity, and growth, providing indicators of the cost of doing business (see http://rru.worldbank.org/DoingBusiness/default.aspx). The business environment in a country is determined by many factors, including regulation of new entry, access to credit markets, contract enforcement, insolvency procedures and cost, and labor regulations (several indicators for these areas are included in table 5.3). A new business environment indicator from the *Doing Business* database is the employment laws index, constructed by examining the detailed provisions of labor laws (table 5.3).

Public sector policies and institutions can improve service delivery—and private sector business activities

Improving people's standard of living by ensuring access to essential services such as health, education, safety, water, sanitation, and electricity is widely viewed as government's responsibility. An efficient and accountable public sector has institutions that are responsive to citizens, provide information, deliver services efficiently and equitably, and help to enforce people's rights. Making services work better, especially for poor people who often do not get their fair share of public spending on services, is a challenge that can be met by governments, citizens, and private service providers working together.

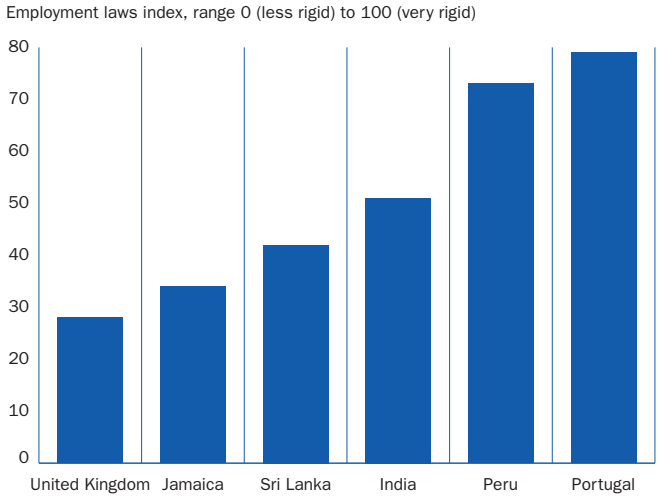
Measuring the quality of public sector governance is difficult. For example, for public goods, including public service delivery, it is difficult to exclude anyone from benefiting from them, so individuals adopt a "free rider" position, resulting in fewer resources being allocated to public goods. Another example is measurement of some dimensions of governance, such as corruption. Corruption is almost impossible to measure directly because of its illegal and clandestine nature. And although no international benchmarks of good governance have been established, and *World Development Indicators* does not report on national governance measures, research shows a strong positive correlation between the quality of institutions and economic growth. A related finding is that as countries become richer, institutions and governance do not necessarily improve. But there is a strong positive causal effect going from better governance to higher per capita incomes (Kaufmann and Kraay 2002).

Despite the difficulty of measuring the quality of institutions and governance, several international and regional initiatives are under way to identify trends and the links to development:

- ***Country Policy and Institutional Assessments*** by the World Bank include ratings covering economic management, structural policies, policies for social inclusion and equity, and public sector management and institutions. Public sector management and institutions include measures of property rights and rule-based governance, quality of budgetary and financial management, efficiency of revenue mobilization, quality of public administration, and transparency, accountability, and corruption of the public sector. These assessments are calculated for World Bank member countries that are eligible for lending by the International Development Association (IDA) (see www.worldbank.org/ida). The African Development Bank conducts similar assessments.
- ***Worldwide Governance Indicators*** from the World Bank Institute measure broad dimensions of governance such as voice and accountability, political instability and violence, government effectiveness, regulatory burden, rule of law, and control of corruption. The database covers 199 countries and territories and draws on 25 sources. Aggregating data from many sources reduces the measurement error from any single source. The database

5a

Higher income economies often have less regulated labor markets than lower income economies



Factors such as the legal tradition (common law, French legal origin) and other political and efficiency considerations determine every country's labor regulations.
Source: *Doing Business* database.

includes point estimates and margins of error, to help interpret the estimates (see www.worldbank.org/wbi/governance/govdata2002/).

- ***Business Environment and Enterprise Performance Surveys*** are a joint European Bank for Reconstruction and Development and World Bank survey covering 22 countries. Survey questions cover issues related to bureaucratic red tape and corruption (see http://info.worldbank.org/governance/beeps/).
- ***African Peer Review Mechanism (APRM),*** launched by the New Partnership for Africa's Development, addresses four dimensions of governance: democracy and political governance, economic governance and management, corporate governance, and socioeconomic development. Sixteen countries have formally joined the APRM (see http://www.touchtech.biz/nepad/).
- ***Code of Good Practices on Fiscal Transparency*** was adopted by the International Monetary Fund (IMF) in 1998 and updated in 2001. Countries volunteer to prepare a Fiscal Report on Standards and Codes. Key requirements of transparency covered in the reports include roles and responsibilities in government; full information disclosure to the public on fiscal activities; open procedures for budget preparation, execution, and reporting; and fiscal information prepared according to internationally accepted standards of data quality and integrity (see http://www.imf.org/external/np/rosc/rosc.asp).

Government functions and policies affect many areas of social and economic life: health and education, natural resources and environmental protection, fiscal and monetary stability, and flows of trade. Data related to these topics are presented in the respective sections. This section provides data on key public sector activities: tax policies, exchange rates, and defense expenditures (tables 5.6–5.8).

Taxes are the principle source of revenue for most governments. They are levied mainly on income, profits, capital gains, goods and services, and exports and imports. (Nontax revenue is also important in some economies; see table 4.13.) A comparison of tax levels across countries provides an overview of the fiscal obligations and incentives facing the private sector. Central government tax revenues range from 2–3 percent of GDP in Myanmar to more than 35 percent in Croatia, Israel, and Slovenia (table 5.6).

The level and progressivity of taxes on personal and corporate income influence incentives to work and invest. Marginal tax rates on individual income range from 0 percent to 50 percent or more. Most marginal tax rates on corporate income are in the 20–30 percent range (table 5.6).

Tapping the benefits of infrastructure, information, and telecommunications

Infrastructure has become an increasingly important part of the World Bank Group's development agenda and is central to the Bank's efforts to help achieve the Millennium Development Goals (tables 1.2–1.4 and *World view*). There is widespread recognition of the key role that infrastructure plays in helping to achieve these goals. Better quality infrastructure—and better access to it—contribute to the success of manufacturing and agricultural businesses by strengthening employment prospects, productivity, and growth. Roads, rails, power, communication, and water and sanitation systems deliver services that promote better health and education. Better housing increases people's earning capacity and assets. And good transportation and schooling advance gender equality and the empowerment of women (table 1.5). New information and communications technologies offer vast opportunities for economic growth, improved health, better service delivery, learning through distance education, and social and cultural advances.

Efficient transport is critical to the development of competitive economies (table 5.9). But measuring progress in transport is difficult. Data for most transport sectors are often not strictly comparable across countries that do not consistently follow common definitions and specifications. Moreover, the data do not indicate the quality and level of service, which depend on such factors as maintenance budgets, the availability of trained personnel, geographic and climatic conditions, and incentives and competition to provide the best service at the lowest cost. Recognizing the need for better data on infrastructure for analysis and project planning, World Bank staff are developing a new database on infrastructure. *World Development Indicators* will report these data as they become available.

New information and communications technologies are helping people everywhere improve their quality of life by creating, using, and sharing information and knowledge (tables 5.10 and 5.11). Successful e-government applications such as Citizen Service Centers in Brazil; income tax on line in Brazil, Jordan, Mexico, and Singapore; and new business registration in China, Jamaica, and Jordan have resulted in more convenience, less corruption, lower costs, and greater transparency. The Internet has spread to every corner of the world, starting with only 8 countries online in 1988 to 209 countries by 2003. But many countries still have a long way to go. In some countries, such as Bangladesh, Chad, Ethiopia, Myanmar, and Tajikistan, only 1–2 people per 1,000 have access to the Internet (table 5.11).

5.1 Private sector investment

	Domestic credit to private sector		Foreign direct investment		Investment in infrastructure projects with private participation[a]							
					$ millions							
	% of GDP		% of GDP		Telecommunications		Energy		Transport		Water and sanitation	
	1990	2002	1990	2002	1990–95	1996–2002	1990–95	1996–2002	1990–95	1996–2002	1990–95	1996–2002
Afghanistan	..	..	..	..	..	70.0	..	..	..	..	..	..
Albania	..	6.8	*0.0*	2.8	..	283.2	..	8.0	..	..	..	..
Algeria	44.4	*6.8*	0.0	1.9	..	501.5	2,300.0	..	..	..	..	..
Angola	..	4.7	–3.3	11.7	..	75.3	..	..	..	..	..	..
Argentina	15.6	15.3	1.3	0.8	11,907.0	13,452.2	12,035.1	13,470.3	5,991.7	8,385.5	5,166.0	3,071.5
Armenia	*40.4*	6.9	..	4.7	..	468.4	..	12.0	..	50.0	..	..
Australia	64.2	*89.8*	2.6	4.1	..	..	..	..	..	..	..	..
Austria	91.6	*106.4*	0.4	0.4	..	..	..	..	..	..	..	..
Azerbaijan	*10.8*	5.6	..	22.9	14.0	144.6	..	375.2	..	..	..	..
Bangladesh	16.7	28.9	0.0	0.1	146.0	594.4	..	1,040.2	..	25.0	..	..
Belarus	..	9.1	..	1.7	10.0	180.3	..	500.0	..	..	..	..
Belgium	37.0	76.3	4.1	..	..	..	..	..	..	..	..	..
Benin	20.3	11.8	3.4	1.5	..	90.4	..	..	..	..	..	..
Bolivia	24.0	51.4	0.6	8.7	38.0	808.9	252.4	2,718.2	..	185.3	..	682.0
Bosnia and Herzegovina	..	36.3	..	5.2	..	..	..	..	..	..	..	..
Botswana	9.4	18.4	2.5	0.7	..	80.0	..	..	..	..	..	..
Brazil	38.9	35.5	0.2	3.7	..	70,824.6	613.6	48,631.8	1,349.4	19,577.8	155.3	3,019.0
Bulgaria	*7.2*	18.4	*0.5*	3.9	64.0	547.3	..	..	..	..	..	152.0
Burkina Faso	16.8	13.5	0.0	0.3	..	36.6	..	5.6	..	..	..	..
Burundi	13.7	26.1	0.1	0.0	0.5	15.6	..	..	..	..	..	..
Cambodia	..	6.8	0.0	1.3	31.6	155.7	..	123.2	120.0	72.2	..	..
Cameroon	26.7	10.2	–1.0	1.0	..	266.1	..	91.9	30.8	95.0	..	..
Canada	75.9	*82.2*	1.3	2.9	..	..	..	..	..	..	..	..
Central African Republic	7.2	5.7	0.0	0.4	1.1	..	..	..	..	..	0.7	..
Chad	7.3	*4.1*	0.5	45.0	..	13.0	..	..	..	..	..	..
Chile	47.2	68.1	2.2	2.7	148.9	1,574.8	2,260.0	6,457.3	539.9	6,709.6	67.5	3,886.1
China	87.7	136.5	1.0	3.9	..	13,024.7	6,113.5	14,301.6	6,219.8	15,849.8	104.0	1,992.4
Hong Kong, China	163.7	150.1	..	7.9	..	..	..	..	..	..	..	..
Colombia	30.8	25.1	1.2	2.5	1,551.2	1,551.0	1,813.2	5,762.2	1,008.8	1,597.4	..	330.0
Congo, Dem. Rep.	1.8	0.7	–0.2	0.6	..	369.7	..	..	..	..	..	..
Congo, Rep.	15.7	2.9	0.0	11.0	4.6	111.9	..	325.0	..	..	..	..
Costa Rica	15.8	*30.1*	2.8	3.9	..	..	76.3	243.1	..	161.0	..	..
Côte d'Ivoire	36.5	14.8	0.4	2.0	..	827.4	147.2	223.0	..	178.0	..	..
Croatia	..	51.6	..	4.4	..	1,425.5	..	375.6	..	672.2	..	298.7
Cuba	..	..	..	..	371.0	60.0	..	165.0	..	..	..	600.0
Czech Republic	..	*33.4*	..	13.4	876.0	7,960.9	356.0	4,718.9	263.7	126.7	36.5	314.6
Denmark	52.2	146.4	0.8	3.7	..	..	..	..	..	..	..	..
Dominican Republic	27.5	40.2	1.9	4.4	10.0	433.2	372.5	1,936.3	..	833.9	..	..
Ecuador	13.6	*27.9*	1.2	5.2	51.2	728.8	..	310.0	12.5	886.8	..	550.0
Egypt, Arab Rep.	30.6	60.6	1.7	0.7	..	2,895.4	..	1,378.0	..	1,057.2	6.0	..
El Salvador	*20.1*	*40.3*	0.0	1.5	..	910.7	106.0	879.2	..	..	..	..
Eritrea	..	32.4	..	3.3	..	40.0	..	..	..	..	..	..
Estonia	*20.2*	29.2	*2.1*	4.4	211.7	629.0	..	26.5	..	299.4	..	81.0
Ethiopia	19.5	26.7	0.1	1.2	..	..	..	..	..	..	..	..
Finland	86.5	*60.0*	0.6	6.2	..	..	..	..	..	..	..	..
France	96.1	87.2	1.1	3.6	..	..	..	..	..	..	..	..
Gabon	13.0	12.0	1.2	2.5	..	35.0	..	624.8	..	46.7	..	..
Gambia, The	11.0	*17.3*	0.0	12.0	..	6.6	..	..	..	..	..	..
Georgia	..	8.1	*0.0*	4.9	21.6	43.8	..	36.0	..	..	..	..
Germany	90.6	118.9	0.2	1.9	..	..	..	..	..	..	..	..
Ghana	4.9	12.0	0.3	0.8	25.0	436.1	..	132.8	..	10.0	..	..
Greece	36.3	*67.1*	1.2	0.0	..	..	..	..	..	..	..	..
Guatemala	14.2	19.1	0.6	0.5	20.0	1,673.3	134.8	1,298.4	..	33.8	..	..
Guinea	*3.5*	3.8	0.6	0.0	45.0	75.3	36.4	..	..	..	..	..
Guinea-Bissau	22.0	3.0	0.8	0.5	..	..	23.2	..	..	..	..	..
Haiti	12.6	18.0	0.0	0.2	..	19.5	4.7	..	..	..	..	..

Private sector investment 5.1

	Domestic credit to private sector		Foreign direct investment		Investment in infrastructure projects with private participation [a]							
					$ millions							
	% of GDP		% of GDP		Telecommunications		Energy		Transport		Water and sanitation	
	1990	2002	1990	2002	1990–95	1996–2002	1990–95	1996–2002	1990–95	1996–2002	1990–95	1996–2002
Honduras	31.1	40.7	1.4	2.2	..	71.1	95.3	86.8	..	130.5	..	220.0
Hungary	46.6	35.3	0.9	1.3	3,510.9	5,298.9	2,156.7	1,906.1	1,004.0	135.0	10.9	167.6
India	25.2	32.6	0.1	0.6	720.5	14,950.0	2,888.5	9,680.5	126.9	1,969.1	..	216.0
Indonesia	46.9	22.3	1.0	–0.9	3,549.0	9,215.5	3,202.5	7,534.7	1,204.9	2,314.6	3.8	919.5
Iran, Islamic Rep.	32.5	34.3	–0.3	0.0	5.0	28.0	..	..	..	..	..	..
Iraq	..	..	..	..	..	..	..	..	..	..	..	..
Ireland	47.6	110.3	1.3	20.3	..	..	..	..	..	..	..	..
Israel	57.6	97.8	0.3	1.6	..	..	..	..	..	..	..	..
Italy	56.5	82.3	0.6	1.2	..	..	..	..	..	..	..	..
Jamaica	36.1	15.7	3.0	6.1	..	494.0	289.0	201.0	30.0	390.0	..	..
Japan	195.1	*175.3*	0.1	0.2	..	..	..	..	..	..	..	..
Jordan	72.3	73.5	0.9	0.6	43.0	967.9	..	..	..	182.0	..	209.0
Kazakhstan	..	18.6	*0.4*	10.5	30.0	1,849.5	..	2,125.0	..	..	..	40.0
Kenya	32.8	23.4	0.7	0.4	..	107.0	..	171.5	..	53.4	..	..
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	65.5	115.6	0.3	0.4	2,650.0	17,600.0	..	2,690.0	2,280.0	5,950.0	..	..
Kuwait	*52.1*	73.8	0.0	0.0	..	..	..	..	..	..	..	..
Kyrgyz Republic	..	4.2	*0.0*	0.3	..	94.0	..	..	..	..	..	..
Lao PDR	1.0	8.4	0.7	1.5	..	185.5	..	535.5	..	100.0	..	..
Latvia	..	29.0	*0.6*	4.5	230.0	894.9	..	177.1	..	75.0	..	..
Lebanon	79.4	90.8	0.2	1.5	100.0	550.9	..	..	..	200.0	..	..
Lesotho	15.8	14.3	2.8	11.3	..	33.5	..	..	..	..	..	..
Liberia	*30.9*	3.2	0.0	–11.6	..	..	..	..	..	..	..	..
Libya	31.0	18.0	..	..	..	..	..	..	..	..	..	..
Lithuania	..	14.2	*0.0*	5.2	74.0	1,345.0	..	20.0	..	..	..	..
Macedonia, FYR	..	17.7	..	2.0	..	607.3	..	..	..	..	..	..
Madagascar	16.9	9.3	0.7	0.2	5.0	10.1	..	..	..	20.3	..	..
Malawi	10.9	4.1	1.2	0.3	8.0	25.5	..	..	..	6.0	..	..
Malaysia	*108.5*	146.1	5.3	3.4	2,630.0	3,241.6	6,909.5	2,131.6	4,657.6	7,919.0	3,986.7	1,105.5
Mali	12.8	17.6	0.2	3.0	..	42.7	0.1	747.0	..	..	..	..
Mauritania	43.5	*31.7*	0.7	1.2	..	99.6	..	..	..	..	..	..
Mauritius	35.6	61.3	1.7	0.6	..	365.6	..	109.3	..	42.6	..	..
Mexico	17.5	12.6	1.0	2.3	18,031.0	17,426.2	1.0	5,759.1	7,910.3	5,432.5	312.1	331.5
Moldova	*5.9*	17.6	*0.0*	6.8	..	84.6	..	85.3	..	..	..	..
Mongolia	*19.0*	18.8	..	7.0	13.1	20.4	..	..	..	..	..	..
Morocco	34.0	54.4	0.6	1.2	..	3,643.0	2,300.0	4,819.9	..	..	..	1,000.0
Mozambique	17.6	2.1	0.4	11.3	..	44.0	..	1,200.0	..	959.7	..	0.6
Myanmar	4.7	*12.1*	..	..	4.0	..	394.0	..	..	50.0	..	..
Namibia	22.6	48.4	..	..	18.0	4.0	..	5.0	..	450.0	..	..
Nepal	12.8	*30.7*	0.0	0.2	..	45.6	131.4	137.2	..	..	..	..
Netherlands	80.0	147.9	3.6	6.8	..	..	..	..	..	..	..	..
New Zealand	76.0	118.1	4.0	1.4	..	..	..	..	..	..	..	..
Nicaragua	112.6	30.8	0.0	4.3	9.9	162.2	..	347.4	..	104.0	..	..
Niger	12.3	5.0	1.6	0.4	..	52.7	..	..	..	..	..	4.9
Nigeria	9.4	17.8	2.1	2.9	..	982.7	..	225.0	..	22.8	..	..
Norway	81.7	86.3	0.9	0.5	..	..	..	..	..	..	..	..
Oman	22.9	38.6	1.4	0.2	..	..	204.5	998.3	..	546.1	..	..
Pakistan	27.7	27.9	0.6	1.4	602.0	343.0	3,417.3	2,519.7	299.6	118.7	..	..
Panama	46.7	97.6	2.6	0.5	..	1,429.2	..	1,064.9	409.9	806.0	..	25.0
Papua New Guinea	28.6	*13.7*	4.8	1.8	..	..	..	65.0	..	..	..	175.0
Paraguay	15.8	24.2	1.5	–0.4	48.1	204.4	..	..	..	58.0	..	..
Peru	11.8	23.1	0.2	4.2	2,568.7	5,412.0	1,207.8	3,095.7	6.6	315.8	..	56.0
Philippines	22.3	36.4	1.2	1.4	1,279.0	6,700.0	6,831.3	7,013.1	300.0	2,007.5	..	5,867.7
Poland	21.1	28.8	0.2	2.2	479.0	11,070.3	145.0	2,154.8	3.1	705.9	..	22.1
Portugal	49.1	147.9	3.7	3.5	..	..	..	..	..	..	..	..
Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..

5.1 Private sector investment

	Domestic credit to private sector		Foreign direct investment		Investment in infrastructure projects with private participation[a]							
					$ millions							
	% of GDP		% of GDP		Telecommunications		Energy		Transport		Water and sanitation	
	1990	2002	1990	2002	1990–95	1996–2002	1990–95	1996–2002	1990–95	1996–2002	1990–95	1996–2002
Romania	..	8.3	0.0	2.5	5.0	2,735.0	..	100.0	..	23.4	..	1,040.0
Russian Federation	..	17.6	*0.0*	0.9	918.0	6,467.2	1,100.0	2,295.3	..	515.4	..	108.0
Rwanda	6.9	10.3	0.3	0.2	..	15.6	..	..	..	..	..	..
Saudi Arabia	54.7	58.2	..	..	..	..	..	..	..	..	..	..
Senegal	26.5	19.6	1.0	1.9	..	406.8	..	124.0	..	..	..	6.3
Serbia and Montenegro	..	..	..	3.0	..	1,929.5	..	..	..	..	..	..
Sierra Leone	3.2	3.5	5.0	0.6	..	23.5	..	..	..	..	..	..
Singapore	96.8	115.5	15.1	7.0	..	..	..	..	..	..	..	..
Slovak Republic	..	40.6	..	16.9	118.6	1,754.1	..	3,184.6	..	..	..	..
Slovenia	*34.9*	39.2	*0.9*	8.5	..	..	..	..	..	..	..	..
Somalia	..	..	0.6	..	..	2.0	..	..	..	..	..	..
South Africa	81.0	131.7	..	0.7	1,072.8	10,654.8	3.0	1,244.3	..	1,874.1	..	212.5
Spain	80.2	111.1	2.7	3.3	..	..	..	..	..	..	..	..
Sri Lanka	19.6	28.5	0.5	1.5	43.6	849.6	21.7	286.6	..	240.0	..	..
Sudan	4.8	5.0	0.0	4.7	..	6.0	..	..	..	..	..	..
Swaziland	20.7	14.3	3.4	3.8	..	33.6	..	..	..	..	..	..
Sweden	124.4	*43.6*	0.8	4.9	..	..	..	..	..	..	..	..
Switzerland	167.9	159.0	2.6	1.3	..	..	..	..	..	..	..	..
Syrian Arab Republic	7.5	8.0	0.6	1.1	..	130.0	..	..	..	..	..	..
Tajikistan	..	18.8	*0.5*	0.7	..	1.0	..	..	..	..	..	..
Tanzania	13.9	6.3	0.0	2.6	30.1	321.0	6.0	490.0	..	23.0	..	..
Thailand	83.4	102.5	2.9	0.7	4,814.0	5,116.2	2,059.6	6,981.0	2,395.9	546.4	153.0	347.5
Togo	22.6	13.3	1.1	5.4	..	5.0	..	..	..	..	..	..
Trinidad and Tobago	44.7	40.7	2.2	7.6	47.0	146.7	..	207.0	..	..	..	120.0
Tunisia	*66.2*	68.6	0.6	3.8	..	277.0	627.0	265.0	..	..	..	..
Turkey	16.7	14.9	0.5	0.6	190.3	7,875.4	2,478.0	5,167.2	..	724.8	..	942.0
Turkmenistan	..	*2.3*	..	1.3	..	..	..	..	..	..	..	..
Uganda	*4.0*	6.7	0.0	2.6	8.8	204.1	..	..	..	..	..	..
Ukraine	*2.6*	18.0	*0.3*	1.7	100.6	1,299.9	..	160.0	..	..	..	..
United Arab Emirates	37.4	55.9	..	..	..	..	..	..	..	..	..	..
United Kingdom	115.8	142.6	3.4	1.8	..	..	..	..	..	..	..	..
United States	93.5	140.6	0.8	0.4	..	..	..	..	..	..	..	..
Uruguay	32.4	66.4	0.0	1.5	19.0	57.7	86.0	330.0	96.0	621.2	10.0	351.0
Uzbekistan	..	..	*0.1*	0.8	2.5	367.4	..	..	..	..	..	..
Venezuela, RB	25.4	9.8	0.9	0.7	4,603.3	6,446.7	..	133.0	100.0	268.0	..	44.0
Vietnam	*2.5*	43.1	2.8	4.0	128.0	18.0	..	2,215.5	10.0	115.0	..	212.8
West Bank and Gaza	..	..	..	..	65.0	410.6	..	150.0	..	..	..	9.5
Yemen, Rep.	6.1	6.2	–2.7	1.1	25.0	340.0	..	..	..	190.0	..	..
Zambia	8.9	6.2	6.2	5.3	..	56.9	..	289.4	..	..	..	..
Zimbabwe	23.0	37.0	–0.1	0.3	..	46.0	..	603.0	18.0	70.0	..	..
World	**97.5 w**	**118.1 w**	**1.0 w**	**2.0 w**	**.. s**	**.. s**	**.. s**	**.. s**	**.. s**	**.. s**	**.. s**	**.. s**
Low income	26.5	*26.5*	0.4	1.2	5,395.3	31,713.9	10,251.3	29,334.5	1,810.2	6,518.8	4.5	1,535.1
Middle income	42.9	*62.2*	0.9	2.8	56,414.0	228,094.2	53,083.3	156,285.5	32,299.2	80,769.9	10,008.0	27,245.8
Lower middle income	50.3	76.7	0.6	2.7	13,427.6	152,884.0	28,718.7	112,141.9	11,323.0	47,579.9	418.3	17,377.6
Upper middle income	27.3	*34.5*	1.4	2.9	42,986.4	75,210.2	24,364.6	44,143.6	20,976.2	33,190.0	9,589.7	9,868.2
Low & middle income	39.3	*55.9*	0.8	2.5	61,809.3	259,808.1	63,334.6	185,620.0	34,109.4	87,288.7	10,012.5	28,780.9
East Asia & Pacific	74.0	*116.5*	1.6	3.1	12,481.7	37,827.2	25,510.4	40,901.2	14,908.2	28,974.5	4,247.5	10,620.4
Europe & Central Asia	..	21.9	*0.4*	2.9	6,856.2	55,357.0	6,235.7	23,427.6	1,270.8	3,327.8	47.4	3,166.0
Latin America & Carib.	28.4	*24.4*	0.7	2.7	39,482.4	123,980.3	19,482.2	93,198.0	17,455.1	46,534.7	5,710.9	13,335.7
Middle East & N. Africa	39.5	50.2	0.6	*0.9*	238.0	9,744.3	5,431.5	7,611.2	..	2,225.3	6.0	1,218.5
South Asia	24.6	*31.8*	0.1	0.7	1,512.1	16,852.6	6,458.9	13,664.2	426.5	2,352.8	..	216.0
Sub-Saharan Africa	42.4	53.5	..	2.5	1,238.9	16,046.7	215.9	6,817.8	48.8	3,873.6	0.7	224.3
High income	107.7	133.1	1.0	1.9	..	..	..	..	..	..	..	..
Europe EMU	79.8	102.8	1.1	5.0	..	..	..	..	..	..	..	..

a. Data refer to total for the period shown.

Private sector investment 5.1

About the data

Private sector development and investment—that is, tapping private sector initiative and investment for socially useful purposes—are critical for poverty reduction. In parallel with public sector efforts, private investment, especially in competitive markets, has tremendous potential to contribute to growth. Private markets serve as the engine of productivity growth, creating productive jobs and higher incomes. And with government playing a complementary role of regulation, funding, and provision of services, private initiative and investment can help provide the basic services and conditions that empower the poor—by improving health, education, and infrastructure.

Credit is an important link in the money transmission process; it finances production, consumption, and capital formation, which in turn affect the level of economic activity. 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), deposit money banks, and other banking institutions, such as finance companies, development banks, and savings and loan institutions. In some cases credit to the private sector may include credit to state-owned or partially state-owned enterprises.

The statistics on foreign direct investment are based on balance of payments data reported by the 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).

Private participation in infrastructure has made important contributions to easing fiscal constraints, improving the efficiency of infrastructure services, and 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 greater competition and customer focus. In 1990–2002 more than 130 developing countries introduced private participation in at least one infrastructure sector, awarding almost 2,500 projects attracting investment commitments of $750 billion.

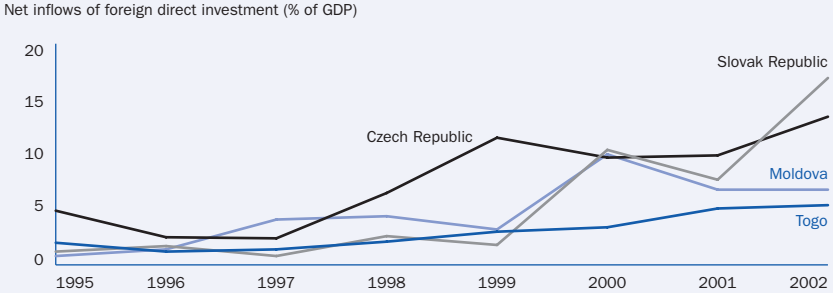
The data on investment in infrastructure projects with private participation refer to all investment (public and private) in projects in which a private company assumes operating risk during the operating period or assumes development and operating risk during the contract period. Foreign state-owned companies are considered private entities for the purposes of this measure. The data are from the World Bank's Private Participation in Infrastructure (PPI) Project Database, which tracks almost 2,500 projects, newly owned or managed by private companies, that reached financial closure in low- and middle-income economies in 1990–2002. For more information, see http://www.worldbank.org/privatesector/ppi/ppi_database.htm.

Definitions

• **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. • **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. • **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. Incinerators, movable assets, stand-alone solid waste projects, and small projects such as windmills are excluded. The types of projects included are operation and management contracts, operation 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.

5.1a

Foreign direct investment has expanded rapidly in many developing countries, contributing to increased productivity



Source: World Bank data files.

Data sources

The data on domestic credit are from the IMF's *International Financial Statistics.* 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 investment in infrastructure projects with private participation are from the World Bank's Private Participation in Infrastructure (PPI) Project Database (http://www.worldbank.org/privatesector/ppi/ppi_database.htm).

5.2 Investment climate

	Credit markets			Composite ICRG risk rating [a]	Institutional Investor credit rating [a]	Euromoney country credit-worthiness rating [a]	Moody's sovereign long-term debt rating [a]		Standard & Poor's sovereign long-term debt rating [a]	
	Creditor rights index range 0 (weak) to 4 (strong) January 2003	Public registry coverage borrowers per 1,000 adults January 2003	Private bureau coverage borrowers per 1,000 adults January 2003	December 2003	September 2003	September 2003	Foreign currency January 2004	Domestic currency January 2004	Foreign currency January 2004	Domestic currency January 2004
Afghanistan	..	..	..	..	7.6	7.8	..	..	..	..
Albania	3	0	0	66.8	17.0	34.5	..	..	..	..
Algeria	1	0	0	66.3	41.6	41.3	..	..	..	..
Angola	3	19	0	53.3	17.0	26.9	..	..	..	..
Argentina	1	202	645	64.0	18.4	25.8	Caa1	B3	SD	SD
Armenia	2	0	0	62.3	17.9	33.8	..	..	..	..
Australia	3	0	897	81.8	84.3	91.7	Aaa	Aaa	AAA	AAA
Austria	3	10	366	86.0	90.3	92.4	Aaa	Aaa	AAA	AAA
Azerbaijan	3	0	0	69.0	30.4	43.3	..	..	..	..
Bangladesh	2	2	0	63.0	28.6	38.3	..	..	..	..
Belarus	2	..	0	65.3	17.5	32.0	..	..	..	..
Belgium	2	82	50	85.3	87.2	90.9	Aa1	Aa1	AA+	AA+
Benin	1	2	0	..	20.2	30.9	..	..	B+	B+
Bolivia	2	88	213	65.8	27.5	37.5	B3	B3	B–	B–
Bosnia and Herzegovina	3	0	80	..	26.0	35.6	..	..	..	..
Botswana	3	0	615	79.8	62.2	60.3	A2	A1	A	A+
Brazil	1	60	602	65.5	37.1	47.6	B2	B2	B+	BB
Bulgaria	3	6	0	71.8	47.0	50.7	Ba2	Ba2	BB+	BBB
Burkina Faso	1	2	0	57.8	17.8	31.0	..	..	..	..
Burundi	1	1	0	..	10.5	25.0	..	..	..	..
Cambodia	2	0	0	..	18.7	35.0	..	..	..	..
Cameroon	1	1	0	62.0	19.9	31.3	..	..	B	B
Canada	1	0	976	85.8	90.3	92.1	Aaa	Aaa	AAA	AAA
Central African Republic	2	1	0	..	12.8	26.2	..	..	..	..
Chad	1	0	0	..	14.4	27.7	..	..	..	..
Chile	2	284	1,000	77.0	65.2	66.3	Baa1	A1	A	AA
China	2	4	0	77.3	59.9	61.5	A2	..	BBB	..
Hong Kong, China	4	0	242	82.0	67.8	80.6	A1	Aa3	A+	AA–
Colombia	0	0	269	63.5	37.2	47.2	Ba2	Baa2	BB	BBB
Congo, Dem. Rep.	2	0	0	47.0	7.3	18.4	..	..	..	..
Congo, Rep.	0	0	0	48.8	12.6	26.7	..	..	..	..
Costa Rica	1	10	78	72.0	44.4	54.8	Ba1	Ba1	BB	BB+
Côte d'Ivoire	1	2	0	55.8	15.7	26.6	..	..	..	..
Croatia	3	0	0	72.0	50.9	57.1	Baa3	Baa1	BBB–	BBB+
Cuba	..	..	..	60.3	12.3	12.0	Caa1	..	..	..
Czech Republic	3	12	163	77.8	65.6	66.1	A1	A1	A–	A+
Denmark	3	0	71	85.5	91.0	95.3	Aaa	Aaa	AAA	AAA
Dominican Republic	2	..	617	60.3	36.6	43.4	B2	B2	CCC	CCC
Ecuador	1	121	0	62.5	24.2	36.2	Caa2	Caa1	CCC+	CCC+
Egypt, Arab Rep.	1	..	0	66.0	41.1	49.2	Ba1	Baa1	BB+	BBB–
El Salvador	3	197	192	69.8	46.4	49.3	Baa3	Baa2	BB+	BB+
Eritrea	..	..	..	..	12.0	26.0	..	..	..	..
Estonia	..	..	..	75.0	61.5	64.5	A1	A1	A–	A–
Ethiopia	3	0	0	59.3	16.1	29.4	..	..	..	..
Finland	1	0	842	86.8	90.6	93.8	Aaa	Aaa	AAA	AAA
France	0	15	0	79.0	91.7	91.1	Aaa	Aaa	AAA	AAA
Gabon	..	..	..	65.3	22.7	34.1	..	..	..	..
Gambia, The	..	..	..	67.0	17.8	32.2	..	..	..	..
Georgia	..	0	0	..	18.4	26.5	..	..	..	..
Germany	3	6	813	81.8	86.8	90.3	Aaa	Aaa	AAA	AAA
Ghana	1	0	1	62.8	25.8	35.0	..	..	B+	B+
Greece	1	0	100	76.0	73.1	80.7	A1	A1	A+	A+
Guatemala	1	0	65	67.0	32.3	44.6	Ba2	Ba1	BB–	BB
Guinea	1	0	0	62.0	16.5	27.2	..	..	..	..
Guinea-Bissau	..	..	..	46.5	10.6	23.0	..	..	..	..
Haiti	2	2	0	52.0	15.8	24.4	..	..	..	..

5.2 Investment climate

	Credit markets			Composite ICRG risk rating [a]	Institutional Investor credit rating [a]	Euromoney country credit-worthiness rating [a]	Moody's sovereign long-term debt rating [a]		Standard & Poor's sovereign long-term debt rating [a]	
	Creditor rights index range 0 (weak) to 4 (strong) January 2003	Public registry coverage borrowers per 1,000 adults January 2003	Private bureau coverage borrowers per 1,000 adults January 2003	December 2003	September 2003	September 2003	Foreign currency January 2004	Domestic currency January 2004	Foreign currency January 2004	Domestic currency January 2004
Honduras	2	74	0	62.3	25.3	39.2	B2	B2	..	..
Hungary	2	0	17	76.5	65.4	68.8	A1	A1	A–	A
India	3	0	0	69.0	48.0	54.9	Ba1	Ba2	BB	BB+
Indonesia	2	4	0	60.8	30.3	40.0	B2	B2	B	B+
Iran, Islamic Rep.	2	..	0	70.5	36.6	45.1	..	..	..	..
Iraq	..	..	..	42.0	8.4	4.3	..	..	..	..
Ireland	1	0	917	87.3	87.5	92.3	Aaa	Aaa	AAA	AAA
Israel	3	0	64	72.5	53.4	68.0	A2	A2	A–	A+
Italy	1	63	482	80.0	83.1	86.9	Aa2	Aa2	AA	AA
Jamaica	2	0	0	69.5	27.8	43.3	B1	Ba2	B	B+
Japan	2	0	907	86.5	77.2	90.0	Aa1	A2	AA–	AA–
Jordan	1	30	0	71.0	38.5	44.1	Ba2	Baa3	BB	BBB
Kazakhstan	..	0	0	72.3	41.4	50.3	Baa3	Baa1	BB+	BBB
Kenya	4	0	526	65.8	24.6	36.1	..	..	..	..
Korea, Dem. Rep.	..	..	..	53.5	7.5	3.3	..	..	..	..
Korea, Rep.	3	0	672	80.8	68.5	67.7	A3	A3	A–	A+
Kuwait	2	0	207	86.3	79.2	73.9	A2	A2	A+	A+
Kyrgyz Republic	..	0	0	..	16.7	28.1	..	..	..	..
Lao PDR	0	0	0	..	19.8	33.0	..	..	..	..
Latvia	..	0	0	78.3	51.5	62.1	A2	A2	BBB+	A–
Lebanon	4	0	0	55.5	25.2	38.1	B2	B3	B–	B–
Lesotho	2	0	0	..	29.5	33.7	..	..	..	..
Liberia	..	..	..	36.0	6.6	11.6	..	..	..	..
Libya	..	..	..	74.0	34.2	21.9	..	..	..	..
Lithuania	..	9	0	76.5	55.6	62.0	A3	A3	BBB+	A–
Macedonia, FYR	3	3	0	..	25.3	36.1	..	..	..	..
Madagascar	2	3	0	60.0	15.8	28.0	..	..	..	..
Malawi	2	0	0	54.0	18.8	31.3	..	..	..	..
Malaysia	2	154	676	75.3	61.7	62.1	Baa1	A3	A–	A+
Mali	1	1	0	58.5	18.4	30.4	..	..	..	..
Mauritania	3	0	0	..	18.6	26.7	..	..	..	..
Mauritius	..	..	..	..	53.9	54.9	Baa2	A2	..	..
Mexico	0	0	562	71.5	54.8	61.1	Baa2	Baa1	BBB–	A–
Moldova	..	0	0	64.5	18.7	31.5	Caa1	Caa1	..	..
Mongolia	1	23	0	63.8	22.9	37.3	..	..	B	B
Morocco	1	..	0	75.0	49.4	53.8	Ba1	Ba1	BB	BBB
Mozambique	2	1	0	61.3	20.6	32.5	..	..	..	..
Myanmar	..	..	..	59.5	13.5	20.4	..	..	..	..
Namibia	..	0	..	76.5	39.8	24.5	..	..	..	..
Nepal	2	0	0	..	23.8	37.2	..	..	..	..
Netherlands	3	0	645	85.0	92.2	93.5	Aaa	Aaa	AAA	AAA
New Zealand	4	0	1,000	81.8	81.1	87.1	Aaa	Aaa	AA+	AAA
Nicaragua	4	83	0	54.3	18.0	24.2	Caa1	B3	..	..
Niger	1	1	0	57.5	14.7	30.5	..	..	..	..
Nigeria	4	0	0	57.0	20.2	33.5	..	..	..	..
Norway	2	0	1,000	90.5	92.9	97.8	Aaa	Aaa	AAA	AAA
Oman	0	0	0	81.0	56.5	61.3	Baa2	Baa2	BBB	BBB+
Pakistan	1	1	0	63.5	26.2	32.0	B2	B2	B	BB–
Panama	4	0	428	71.5	45.0	49.8	Ba1	..	BB	BB
Papua New Guinea	2	0	0	59.0	28.9	37.3	B1	B1	B	B+
Paraguay	2	0	..	62.5	22.4	34.7	Caa1	Caa1	SD	CCC
Peru	0	133	267	68.3	38.3	45.5	Ba3	Baa3	BB–	BB+
Philippines	1	0	33	69.3	43.8	51.3	Ba1	Baa3	BB	BBB
Poland	2	0	665	75.0	61.1	64.0	A2	A2	BBB+	A–
Portugal	1	610	30	78.5	80.4	84.3	Aa2	Aa2	AA	AA
Puerto Rico	1	0	643	..	..	..	..	..	..	..

5.2 Investment climate

	Credit markets			Composite ICRG risk rating [a]	Institutional Investor credit rating [a]	Euromoney country credit-worthiness rating [a]	Moody's sovereign long-term debt rating [a]		Standard & Poor's sovereign long-term debt rating [a]	
	Creditor rights index range 0 (weak) to 4 (strong) January 2003	Public registry coverage borrowers per 1,000 adults January 2003	Private bureau coverage borrowers per 1,000 adults January 2003	December 2003	September 2003	September 2003	Foreign currency January 2004	Domestic currency January 2004	Foreign currency January 2004	Domestic currency January 2004
Romania	0	1	0	70.5	41.3	49.8	Ba3	Ba3	BB	BB+
Russian Federation	2	0	0	75.0	45.1	49.0	Baa3	Baa3	BB	BB+
Rwanda	1	1	0	..	8.2	24.2	..	..	..	..
Saudi Arabia	2	0	0	76.5	52.4	65.7	Baa2	Baa1	A+	A+
Senegal	1	3	0	64.8	29.2	39.6	..	..	B+	B+
Serbia and Montenegro	2	0	0	55.3	16.1	31.5	..	..	..	..
Sierra Leone	2	0	0	51.3	8.5	22.2	..	..		
Singapore	3	0	640	87.5	84.2	89.1	Aaa	Aaa	AAA	AAA
Slovak Republic	..	3	0	74.3	57.8	59.1	A3	A3	BBB	A–
Slovenia	3	16	0	79.5	69.2	76.1	Aa3	Aa3	A+	AA
Somalia	..	..	..	45.5	6.5	13.2	..	..	..	..
South Africa	3	0	684	68.8	54.6	60.4	Baa2	A2	BBB	A
Spain	2	344	55	80.0	85.7	87.2	Aaa	Aaa	AA+	AA+
Sri Lanka	2	12	0	63.5	34.1	44.3	..	..	..	..
Sudan	..	..	..	54.3	10.5	26.4	..	..	..	..
Swaziland	..	..	..	..	30.7	33.1	..	..	..	..
Sweden	1	0	592	86.5	89.3	93.8	Aaa	Aaa	AA+	AAA
Switzerland	1	0	213	91.0	94.0	97.5	Aaa	Aaa	AAA	AAA
Syrian Arab Republic	..	0	0	70.3	22.7	33.5	..	..	..	..
Tajikistan	..	..	..	..	14.3	29.9	..	..	..	..
Tanzania	2	0	0	57.8	21.8	37.0	..	..	..	..
Thailand	3	0	127	76.5	56.9	59.5	Baa1	Baa1	BBB	A
Togo	2	..	0	58.3	17.3	28.1	..	..	..	..
Trinidad and Tobago	..	..	..	76.5	54.2	61.0	Baa3	Baa1	BBB	A–
Tunisia	0	6	0	72.8	52.6	57.7	Baa2	Baa2	BBB	A
Turkey	2	10	266	62.8	32.4	45.2	B1	B3	B+	B+
Turkmenistan	..	..	..	..	20.8	32.2	B2	B2	..	..
Uganda	..	0	0	62.3	20.1	37.8	..	..	..	..
Ukraine	2	0	0	68.8	32.5	39.0	B1	B1	B	B
United Arab Emirates	2	15	0	84.5	64.7	72.3	A2	..	..	..
United Kingdom	4	0	813	83.8	92.3	93.9	Aaa	Aaa	AAA	AAA
United States	1	0	1,000	75.8	92.8	96.6	Aaa	Aaa	AAA	AAA
Uruguay	..	65	630	64.5	27.3	39.8	B3	B3	B–	B–
Uzbekistan	2	0	0	..	20.5	33.9	..	..	..	..
Venezuela, RB	2	141	0	58.3	27.1	34.6	Caa1	Caa1	B–	B–
Vietnam	0	3	0	69.8	37.7	47.8	B1	..	BB–	BB
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	0	12	0	67.0	24.3	33.0	..	..	..	..
Zambia	1	0	0	53.0	15.3	26.3	..	..	..	..
Zimbabwe	4	0	0	34.3	11.0	22.6	..	..	..	..
World	**2 u**	**24 u**	**182 u**	**68.9 m**	**30.4 m**	**39.6 m**				
Low income	2	4	11	58.8	17.9	30.1				
Middle income	2	32	168	70.4	39.8	47.2				
Lower middle income	2	24	100	68.3	36.6	44.1				
Upper middle income	2	46	288	75.0	54.0	60.6				
Low & middle income	2	18	93	65.1	25.3	35.6				
East Asia & Pacific	2	19	84	66.6	29.6	38.7				
Europe & Central Asia	2	2	50	72.0	32.5	44.3				
Latin America & Carib.	2	77	293	65.0	30.0	43.3				
Middle East & N. Africa	1	6	0	70.5	38.5	44.1				
South Asia	2	3	0	63.5	27.4	37.8				
Sub-Saharan Africa	2	1	57	58.0	17.5	28.7				
High income	2	40	491	83.4	86.3	90.6				
Europe EMU	2	103	391	81.8	87.2	90.9				

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About the data

This year the table includes newly developed measures of the credit market: a creditor rights index, public credit registry coverage, and private credit bureau coverage. The data are from the World Bank's *Doing Business* database.

As investment portfolios become increasingly global, investors as well as governments seeking to attract investment must have a good understanding of the investment climate. This table includes data on credit market risks and indicators of creditworthiness ratings from several major international rating services.

Lack of access to credit is one of the biggest barriers entrepreneurs face in starting and operating a business. And this in turn affects growth in the economy and opportunities for improved livelihoods. Information on credit histories made available in credit registries is one way for creditors to assess risk and allocate credit more efficiently. Information on creditor rights and how well collateral systems facilitate access to credit offers an additional institutional solution to expanding credit. The creditor rights index is an indicator of the powers of secured lenders in liquidation and reorganization. This composite index captures information on issues related to reorganization of insolvent companies, the ability of secured creditors to seize collateral if there is a reorganization, whether secured creditors are paid first from proceeds from liquidating a bankrupt firm, and whether management remains in power during a reorganization. The index ranges from 0 for weak creditor rights to 4 for strong creditor rights. A public credit registry is a database owned by public authorities (usually the central bank or banking supervisory) that collect information on the standing of borrowers in the financial system and make it available to financial institutions. A private credit bureau is a private firm or nonprofit organization that maintains a database on the standing of borrowers in the financial system. Its primary role is to facilitate exchange of information among banks and financial institutions. Coverage of public credit registries and private credit bureaus provides an indication of how many borrowers, as a percentage of the adult population, have information on their payment histories available in credit registries. A score of 0 indicates that a public registry or private bureau does not operate in the country. The maximum score is 1,000.

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 *Data sources*.) Risk ratings may be highly subjective, reflecting external perceptions that do not always capture the actual situation in a country. But these subjective perceptions are the reality that policymakers 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 capacity of entities to honor senior unsecured financial obligations and contracts denominated in foreign currency (foreign currency issuer ratings) or in 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

• **Creditor rights index** measures four powers of secured lenders in liquidation and reorganization: there are restrictions on entering reorganization, there is no automatic stay (or asset freeze), secured creditors are paid first, and management does not stay in reorganization. • **Public registry coverage and private bureau coverage** measure the number of borrowers with records contained in either the public credit registry or private credit bureau, expressed as a percentage of the adult population. A score of 0 indicates that a public registry or private bureau does not operate in the country. The maximum score is 1,000. • **Composite International Country Risk Guide (ICRG) risk rating** is an overall index, ranging from 0 to 100 (highest risk to lowest), based on 22 components of risk. • **Institutional Investor credit rating** ranks, from 0 to 100 (highest risk to lowest), the chances of a country's default. • **Euromoney country creditworthiness rating** ranks, from 0 to 100 (highest risk to lowest), the risk of investing in an economy. • **Moody's sovereign foreign or domestic currency long-term debt rating** assesses the risk of lending to governments. An entity's capacity 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 or domestic currency long-term debt rating** ranges from AAA (extremely strong capacity to meet financial commitments) to CCC (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 credit markets are from the World Bank's Doing Business project (http://rru.worldbank.org/DoingBusiness/). The country risk and creditworthiness ratings are from the PRS Group's monthly *International Country Risk Guide* (http://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 Business environment

	Entry regulations				Contract enforcement			Insolvency		Labor regulations
			% of GNI per capita							
	Number of start-up procedures **January 2003**	Time to start a business days **January 2003**	Cost to register a business **January 2003**	Minimum capital requirement **January 2003**	Procedures to enforce a contract **January 2003**	Time to enforce a contract days **January 2003**	Cost to enforce a contract % of GNI per capita **January 2003**	Time to resolve insolvency years **January 2003**	Cost to resolve insolvency % of insolvency estate **January 2003**	Employment laws index range 0 (less rigid) to 100 (very rigid) **January 2003**
Afghanistan	..	..	..	..	..	..	..	..	..	..
Albania	11	47	65	52	37	220	73	*2.0*	*38*	41
Algeria	18	29	32	73	20	387	13	3.5	4	46
Angola	14	146	838	174	46	865	16	..	..	78
Argentina	15	68	8	0	32	300	9	2.8	18	66
Armenia	10	25	9	11	22	65	15	1.9	4	57
Australia	2	2	2	0	11	320	8	1.0	18	36
Austria	9	29	7	141	20	434	1	1.3	18	30
Azerbaijan	14	106	17	0	25	115	3	2.7	8	63
Bangladesh	7	30	76	0	15	270	270	..	..	50
Belarus	19	118	27	111	19	135	44	2.2	4	77
Belgium	7	56	11	75	22	365	9	0.9	4	48
Benin	9	63	189	378	44	248	31	3.2	18	52
Bolivia	18	67	167	0	44	464	5	2.0	18	66
Bosnia and Herzegovina	12	59	52	379	31	630	21	1.9	8	49
Botswana	10	97	36	0	22	56	0	2.2	18	35
Brazil	15	152	12	0	16	380	2	10.0	8	78
Bulgaria	10	30	8	134	26	410	6	3.8	18	53
Burkina Faso	15	136	325	652	24	376	173	4.0	8	53
Burundi	11	17	253	0	62	367	28	..	..	62
Cambodia	11	94	554	1,826	18	210	269	..	..	54
Cameroon	12	37	191	244	46	548	63	2.0	18	44
Canada	2	3	1	0	17	425	28	0.8	4	34
Central African Republic	..	..	..	..	..	..	0	..	..	62
Chad	19	73	395	652	50	604	58	10.0	38	66
Chile	10	28	12	0	21	200	15	5.8	18	50
China	11	46	14	3,856	20	180	32	2.6	18	47
Hong Kong, China	5	11	2	0	17	180	7	1.0	18	27
Colombia	19	60	27	0	37	527	6	3.0	1	59
Congo, Dem. Rep.	13	215	872	321	55	414	92	..	..	60
Congo, Rep.	8	67	271	205	44	500	51	3.0	18	60
Costa Rica	11	80	21	0	21	370	23	2.5	18	63
Côte d'Ivoire	10	77	143	235	18	150	83	2.2	18	53
Croatia	13	50	18	51	20	330	7	3.1	18	65
Cuba	..	..	..	..	..	..	..	..	..	..
Czech Republic	10	88	12	110	16	270	19	9.2	38	36
Denmark	4	4	0	52	14	83	4	4.2	8	25
Dominican Republic	12	78	48	23	19	495	441	3.5	4	49
Ecuador	14	90	63	28	33	332	11	3.5	18	55
Egypt, Arab Rep.	13	43	61	789	19	202	31	4.3	18	59
El Salvador	12	115	130	550	42	240	7	..	..	69
Eritrea	..	..	..	..	..	..	..	..	..	..
Estonia	..	..	..	..	..	..	..	..	..	..
Ethiopia	8	44	422	1,756	24	895	35	2.2	8	51
Finland	4	33	3	32	19	240	16	0.9	1	55
France	10	53	3	32	21	210	4	2.4	18	50
Gabon	..	..	..	..	..	..	..	..	..	..
Gambia, The	..	..	..	..	..	..	..	..	..	..
Georgia	9	30	26	140	17	180	63	3.2	1	55
Germany	9	45	6	104	22	154	6	1.2	8	51
Ghana	10	84	112	1	21	90	24	*1.6*	*18*	35
Greece	16	45	70	145	15	315	8	2.2	8	67
Guatemala	13	39	67	37	19	1,460	20	4.0	18	65
Guinea	13	71	229	397	41	150	40	..	..	60
Guinea-Bissau	..	..	..	..	..	..	..	..	..	..
Haiti	12	203	199	210	41	76	18	..	..	60

Business environment 5.3

	Entry regulations				Contract enforcement			Insolvency		Labor regulations
	Number of start-up procedures January 2003	Time to start a business days January 2003	% of GNI per capita Cost to register a business January 2003	% of GNI per capita Minimum capital requirement January 2003	Procedures to enforce a contract January 2003	Time to enforce a contract days January 2003	Cost to enforce a contract % of GNI per capita January 2003	Time to resolve insolvency years January 2003	Cost to resolve insolvency % of insolvency estate January 2003	Employment laws index range 0 (less rigid) to 100 (very rigid) January 2003
Honduras	14	80	73	165	32	225	7	..	..	56
Hungary	5	65	64	220	17	365	5	2.0	38	54
India	10	88	50	430	11	365	95	11.3	8	51
Indonesia	11	168	15	303	0	225	269	6.0	18	57
Iran, Islamic Rep.	9	48	7	7	23	150	6	1.8	8	52
Iraq	..	..	..	..	..	..	..	..	..	..
Ireland	3	12	10	0	16	183	7	0.4	8	49
Israel	5	34	5	0	19	315	34	4.0	38	38
Italy	9	23	24	50	16	645	4	1.3	18	59
Jamaica	7	31	16	0	14	202	42	1.1	18	34
Japan	11	31	11	71	16	60	6	0.6	4	37
Jordan	14	98	50	2,404	32	147	0	4.3	8	60
Kazakhstan	10	25	10	35	41	120	8	3.3	18	55
Kenya	11	61	54	0	25	255	50	4.6	18	34
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	12	33	18	403	23	75	5	1.5	4	51
Kuwait	12	33	2	911	17	195	4	4.2	1	41
Kyrgyz Republic	9	26	13	75	44	365	255	4.0	4	64
Lao PDR	9	198	20	151	..	..	0	..	..	54
Latvia	7	11	15	93	19	189	8	1.2	4	62
Lebanon	6	46	130	83	27	721	54	4.0	18	46
Lesotho	9	92	68	20	..	..	0	..	..	45
Liberia	..	..	..	..	..	..	..	..	..	..
Libya	..	..	..	..	..	..	..	..	..	..
Lithuania	9	26	6	74	17	74	13	1.2	18	64
Macedonia, FYR	13	48	13	138	27	509	43	3.6	38	50
Madagascar	15	67	63	31	29	166	120	*2.2*	*18*	61
Malawi	11	45	125	0	16	108	521	2.8	8	52
Malaysia	8	31	27	0	22	270	19	2.2	18	25
Mali	13	61	232	598	27	150	7	3.5	18	54
Mauritania	11	73	110	897	..	..	0	8.0	8	59
Mauritius	..	..	..	..	..	..	..	..	..	..
Mexico	7	51	19	88	47	325	10	2.0	18	77
Moldova	11	42	26	86	36	210	14	2.8	8	67
Mongolia	8	31	12	2,047	26	224	2	4.0	8	50
Morocco	11	36	19	763	17	192	9	1.9	18	51
Mozambique	15	153	100	30	18	540	9	..	..	74
Myanmar	..	..	..	..	..	..	..	..	..	..
Namibia	10	85	19	0	..	..	0	..	..	43
Nepal	8	25	191	0	24	350	44	5.0	8	45
Netherlands	7	11	14	71	21	39	1	2.6	1	54
New Zealand	3	3	0	0	19	50	12	2.0	4	32
Nicaragua	12	71	338	0	17	125	18	2.3	8	61
Niger	11	27	447	844	29	365	57	5.0	18	59
Nigeria	10	44	92	29	23	730	7	1.6	18	43
Norway	4	24	4	33	12	87	10	0.9	1	41
Oman	9	34	5	721	17	250	5	7.0	4	54
Pakistan	10	22	47	0	30	365	46	2.8	4	58
Panama	7	19	26	0	44	197	20	6.5	38	79
Papua New Guinea	7	69	26	0	22	270	41	..	..	26
Paraguay	18	73	156	0	46	188	34	3.9	8	73
Peru	9	100	25	0	35	441	30	2.1	8	73
Philippines	11	59	24	10	28	164	104	5.7	38	60
Poland	12	31	20	21	18	1,000	11	1.5	18	55
Portugal	11	95	13	43	22	420	5	2.6	8	79
Puerto Rico	6	6	3	0	55	365	21	3.8	8	41

5.3 Business environment

	Entry regulations				Contract enforcement			Insolvency		Labor regulations
	Number of start-up procedures **January 2003**	Time to start a business days **January 2003**	% of GNI per capita Cost to register a business **January 2003**	% of GNI per capita Minimum capital requirement **January 2003**	Procedures to enforce a contract **January 2003**	Time to enforce a contract days **January 2003**	Cost to enforce a contract % of GNI per capita **January 2003**	Time to resolve insolvency years **January 2003**	Cost to resolve insolvency % of insolvency estate **January 2003**	Employment laws index range 0 (less rigid) to 100 (very rigid) **January 2003**
Romania	6	27	12	3	28	225	13	3.2	8	54
Russian Federation	12	29	9	30	16	160	20	1.5	4	61
Rwanda	9	43	232	457	0	..	87	..	..	60
Saudi Arabia	14	95	131	1,611	19	195	0	3.0	18	36
Senegal	9	58	124	296	30	335	49	3.0	8	54
Serbia and Montenegro	10	44	13	357	40	1,028	20	7.3	38	56
Sierra Leone	9	26	1,298	0	48	114	8	2.5	38	67
Singapore	7	8	1	0	23	50	14	0.7	1	20
Slovak Republic	10	98	10	112	26	420	13	4.8	18	61
Slovenia	10	61	16	89	22	1,003	4	3.7	18	59
Somalia	..	..	..	..	..	..	..	..	..	..
South Africa	9	38	9	0	26	207	17	2.0	18	36
Spain	11	115	19	20	20	147	11	1.5	8	70
Sri Lanka	8	58	18	0	17	440	8	2.3	18	42
Sudan	..	..	..	..	..	..	..	..	..	..
Swaziland	..	..	..	..	..	..	..	..	..	..
Sweden	3	16	1	41	19	190	8	2.0	8	42
Switzerland	6	20	9	34	14	224	4	4.6	4	36
Syrian Arab Republic	10	42	17	5,627	36	596	31	4.1	8	45
Tajikistan	..	..	..	..	..	..	..	..	..	..
Tanzania	13	35	199	0	14	127	4	3.0	8	61
Thailand	9	42	7	0	19	210	30	2.6	38	61
Togo	14	63	281	531	43	503	21	..	..	57
Trinidad and Tobago	..	..	..	..	..	..	..	..	..	..
Tunisia	10	46	16	352	14	7	4	2.5	8	57
Turkey	13	38	37	13	18	105	5	1.8	8	55
Turkmenistan	..	..	..	..	..	..	..	..	..	..
Uganda	17	36	135	0	16	99	10	2.0	38	42
Ukraine	14	40	27	451	20	224	11	3.0	18	73
United Arab Emirates	10	29	25	404	27	559	11	5.0	38	45
United Kingdom	6	18	1	0	12	101	1	1.0	8	28
United States	5	4	1	0	17	365	0	3.0	4	22
Uruguay	10	27	47	699	38	360	14	4.0	8	39
Uzbekistan	9	33	16	64	34	258	2	3.3	4	55
Venezuela, RB	14	119	19	0	41	360	47	4.0	38	75
Vietnam	11	63	30	0	28	120	9	*2.0*	*18*	56
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	13	96	264	1,717	27	240	1	2.4	4	43
Zambia	6	40	24	138	16	188	16	3.7	8	46
Zimbabwe	10	122	285	0	13	197	40	2.3	18	27
World	**10 u**	**57 u**	**93 u**	**297 u**	**25 u**	**307 u**	**36 u**	**3.2 u**	**14 u**	**53 u**
Low income	11	74	213	339	28	304	65	3.8	13	54
Middle income	11	57	36	369	26	332	27	3.4	17	56
Lower middle income	12	58	38	455	27	333	32	3.3	15	56
Upper middle income	10	56	33	204	25	329	15	3.6	20	55
Low & middle income	11	65	118	355	27	319	44	3.6	15	55
East Asia & Pacific	10	80	73	819	20	208	77	3.8	23	49
Europe & Central Asia	11	47	22	115	26	317	29	3.2	15	58
Latin America & Carib.	12	78	74	90	32	363	39	3.7	16	62
Middle East & N. Africa	12	56	67	1,286	23	281	14	3.5	11	50
South Asia	9	45	76	86	19	358	93	5.3	10	49
Sub-Saharan Africa	11	72	255	278	30	334	52	3.5	18	53
High income	7	30	9	99	19	267	8	2.1	10	44
Europe EMU	9	47	16	65	19	287	6	1.6	9	56

About the data

The table presents key indicators on the environment for doing business. The indicators, covering entry regulations, contract enforcement, insolvency, and labor regulations, identify regulations that enhance or constrain business investment, productivity, and growth. The data are from the World Bank's *Doing Business* database.

A vibrant private sector is central to promoting growth and expanding opportunities for poor people. But encouraging firms to invest, improve productivity, and create jobs requires a legal and regulatory environment that fosters access to credit, protection of property rights, and efficient judicial, taxation, and customs systems. The indicators in the table point to the administrative and regulatory reforms and institutions needed to create a favorable environment for doing business.

When entrepreneurs start a business, the first obstacles they face are the administrative and legal procedures required to register the new firm. Countries differ widely in how they regulate the entry of new businesses. In some countries the process is straightforward and affordable. But in others the procedures are so burdensome that entrepreneurs may opt to run their business informally.

The data on entry regulations are derived from a survey of the procedures that a typical domestic limited-liability company must complete before legally starting operation. The data cover the number and duration of start-up procedures, the cost to register a business, and the minimum capital requirement.

Contract enforcement is critical to enable businesses to engage with new borrowers or customers. Without good contract enforcement, trade and credit will be restricted to a small community of people who have developed relationships through repeated dealings or through the security of assets. The institution that enforces contracts between debtors and creditors, and suppliers and customers, is the court.

The efficiency of contract enforcement is reflected in three indicators: the number of judicial procedures to resolve a dispute, the time it takes to enforce a commercial contract, and the associated costs. The data are derived from structured surveys answered by attorneys at private law firms. The questionnaires cover the step-by-step evolution of a commercial case before local courts in the country's largest city.

The continuing existence of unviable competitors is consistently rated by firms as one of the greatest potential barriers to operation and growth. The institution that deals with the exit of unviable companies and the rehabilitation of viable but financially distressed companies is the insolvency system. Two indicators measure the time it takes to resolve insolvency and the associated costs. With effective insolvency systems, one may expect greater access and better allocation of credit.

All economies have labor regulations intended to protect the interests of workers and to guarantee a minimum standard of living. These laws and institutions encompass four bodies of law: employment laws, industrial relations laws, occupational health and safety laws, and social security laws. The employment laws index is a simple average of the flexibility of hiring index, the conditions of employment index, and the flexibility of firing index; each index has values between 0 and 100, with higher values indicating more rigid regulation. Flexibility of hiring covers the availability of part-time, fixed-term, and family members' contracts. Conditions of employment cover working time requirements, including mandatory minimum daily rest, maximum number of hours in a normal work week, premium for overtime work, and restrictions on weekly holidays; mandatory payment for nonworking days, which includes days of annual leave with pay and paid time off for holidays; and minimum wage legislation. Flexibility of firing covers workers' legal protections against dismissal, including the grounds for dismissal; procedures for dismissal (individual and collective); notice period; and severance payment.

To ensure cross-country comparability, several standard characteristics of a company are defined in all surveys, such as size, ownership, location, legal status, and type of activities undertaken. The data were collected through a study of laws and regulations in each country, surveys of regulators or private sector professionals on each topic, and cooperative arrangements with private consulting firms and business and law associations.

Definitions

• **Start-up procedures** are those required to start a business. Procedures are interactions of a company with external parties (government agencies, lawyers, auditors, notaries, and the like), including interactions required to obtain necessary permits and licenses and to complete all inscriptions, verifications, and notifications to start operations. Data are for businesses with specific characteristics of ownership, size, and type of production. • **Time to start a business** is the time, measured in calendar days, needed to complete the required procedures for legally operating a business. If a procedure can be speeded up at additional cost, the fastest procedure, independent of cost, is chosen. Time spent gathering information about the registration process is excluded. • **Cost to register a business** is normalized by presenting it as a percentage of gross national income (GNI) per capita. • **Minimum capital requirement** is the amount that an entrepreneur needs to deposit in a bank to obtain a company registration number. The amount is typically specified in the commercial code or company law and is often returned to the entrepreneur only when the company is dissolved. • **Procedures to enforce a contract** are independent actions, each defined as a procedure (mandated by law or court regulation) that demands interaction between the parties or between them and the judge or court officer. • **Time to enforce a contract** is the number of calendar days from the time the plaintiff files the lawsuit in court until the time of final determination and, in appropriate cases, payment. • **Cost to enforce a contract** includes filing fees, court costs, and estimated attorney fees. • **Time to resolve insolvency** is the number of years from the time of filing for insolvency in court until the time of resolution of distressed assets. • **Cost to resolve insolvency** includes filing fees, court costs, attorney fees, and payments to other professionals (accountants, assessors), out of the insolvency estate. The costs are averages of the estimates of survey respondents, who chose among six options: 0–2 percent, 3–5 percent, 6–10 percent, 11–25 percent, 26–50 percent, and more than 50 percent. • **Employment laws index** is a composite index of three aspects of labor regulations: flexibility of hiring, conditions of employment, and flexibility of firing. The index ranges from 0 (less rigid) to 100 (more rigid).

Data source

All data are from the World Bank's Doing Business project (http://rru.worldbank.org/DoingBusiness/).

5.4 Stock markets

	Market capitalization				Market liquidity		Turnover ratio		Listed domestic companies		S&P/IFC Investable index	
	$ millions		% of GDP		value traded as % of GDP		value of shares traded as % of market capitalization		number		% change in price index	
	1990	2003	1990	2002	1990	2002	1990	2003	1990	2003	2002	2003
Afghanistan	..	..	..	..	..	..	..	..	..	..	..	..
Albania	..	..	..	..	..	..	..	..	..	..	..	..
Algeria	..	..	..	..	..	..	..	..	..	..	..	..
Angola	..	..	..	..	..	..	..	..	..	..	..	..
Argentina	3,270	38,927	2.3	100.9	0.6	1.3	33.6	1.7	179	107	–51.4	131.4
Armenia	..	..	..	..	..	..	..	..	..	..	..	..
Australia	109,000	*380,969*	35.1	93.1	12.9	72.0	31.6	*77.2*	1,089	*1,355*	..	..
Austria	11,500	*31,664*	7.1	15.5	11.5	2.9	110.3	*21.3*	97	*91*	..	..
Azerbaijan	..	..	..	..	..	..	..	..	..	..	..	..
Bangladesh	321	1,622	1.1	2.5	0.0	1.4	1.5	3.5	134	247	–4.2 [a]	15.4 [a]
Belarus	..	..	..	..	..	..	..	..	..	..	..	..
Belgium	65,400	*127,556*	33.2	52.0	3.3	13.8	..	*247.9*	182	*143*	..	..
Benin	..	..	..	..	..	..	..	..	..	..	..	..
Bolivia	..	*1,560*	..	*19.4*	..	*0.0*	..	*0.1*	..	*29*	..	..
Bosnia and Herzegovina	..	..	..	..	..	..	..	..	..	..	..	..
Botswana	*261*	2,131	*6.6*	32.6	*0.2*	1.0	6.1	1.1	*9*	19	31.1 [a]	25.6 [a]
Brazil	16,400	234,560	3.6	27.4	1.2	10.7	23.6	3.4	581	367	–33.0	105.4
Bulgaria	..	1,755	..	4.7	..	1.1	..	2.0	..	356	62.5 [a]	189.2 [a]
Burkina Faso	..	..	..	..	..	..	..	..	..	..	..	..
Burundi	..	..	..	..	..	..	..	..	..	..	..	..
Cambodia	..	..	..	..	..	..	..	..	..	..	..	..
Cameroon	..	..	..	..	..	..	..	..	..	..	..	..
Canada	242,000	*575,316*	42.1	80.5	12.4	56.8	26.7	*68.2*	1,144	*3,756*	..	..
Central African Republic	..	..	..	..	..	..	..	..	..	..	..	..
Chad	..	..	..	..	..	..	..	..	..	..	..	..
Chile	13,600	86,291	44.9	74.2	2.6	4.9	6.3	0.9	215	240	–14.8	79.5
China	*2,030*	681,204	*0.5*	36.6	*0.2*	26.3	*158.9*	11.5	*14*	1,296	–14.5	77.7
Hong Kong, China	83,400	*463,108*	110.6	286.7	45.9	130.4	43.1	*43.5*	284	*968*	..	..
Colombia	1,420	14,258	3.5	11.9	0.2	0.3	5.6	0.6	80	114	9.7 [a]	27.3 [a]
Congo, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Congo, Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Costa Rica	*475*	..	*5.5*	..	..	..	*5.8*	..	*82*	..	..	..
Côte d'Ivoire	549	1,650	5.1	11.4	0.2	0.1	3.4	0.6	23	38	17.4 [a]	27.4 [a]
Croatia	..	6,126	..	17.7	..	0.7	..	0.7	*2*	66	44.2 [a]	12.8 [a]
Cuba	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	..	17,663	..	22.9	..	8.8	..	6.0	..	63	38.9	54.4
Denmark	39,100	*76,788*	29.3	44.4	8.3	29.8	28.0	*60.3*	258	*201*	..	..
Dominican Republic	..	..	..	..	..	..	..	..	..	..	..	..
Ecuador	*69*	2,153	*0.6*	7.2	..	0.1	..	0.2	*65*	30	23.4 [a]	14.6 [a]
Egypt, Arab Rep.	1,760	27,073	4.1	29.0	0.3	2.8	..	1.6	573	967	–5.8	79.3
El Salvador	..	*1,520*	..	*11.0*	..	*0.2*	..	*1.5*	..	*32*	..	..
Eritrea	..	..	..	..	..	..	..	..	..	..	..	..
Estonia	..	3,790	..	37.3	..	3.7	..	1.6	..	14	66.3 [a]	41.5 [a]
Ethiopia	..	..	..	..	..	..	..	..	..	..	..	..
Finland	22,700	*138,833*	16.5	105.6	2.9	134.2	..	*106.8*	73	*147*	..	..
France	314,000	*966,962*	25.8	67.6	9.6	65.3	..	*88.0*	578	*772*	..	..
Gabon	..	..	..	..	..	..	..	..	..	..	..	..
Gambia, The	..	..	..	..	..	..	..	..	..	..	..	..
Georgia	..	..	..	..	..	..	..	..	..	..	..	..
Germany	355,000	*685,970*	21.2	34.6	30.0	62.1	139.3	*140.5*	413	*715*	..	..
Ghana	*76*	1,426	*1.2*	12.0	..	0.2	..	0.2	*13*	25	27.6 [a]	65.4 [a]
Greece	15,200	*68,741*	18.1	51.8	4.7	18.7	36.3	*26.0*	145	*341*	*–31.2*	..
Guatemala	..	*232*	..	*1.1*	..	*0.0*	..	*3.1*	..	*10*	..	..
Guinea	..	..	..	..	..	..	..	..	..	..	..	..
Guinea-Bissau	..	..	..	..	..	..	..	..	..	..	..	..
Haiti	..	..	..	..	..	..	..	..	..	..	..	..

5.4 Stock markets

	Market capitalization				Market liquidity		Turnover ratio		Listed domestic companies		S&P/IFC Investable index	
	$ millions		% of GDP		value traded as % of GDP		value of shares traded as % of market capitalization		number		% change in price index	
	1990	2003	1990	2002	1990	2002	1990	2003	1990	2003	2002	2003
Honduras	*40*	..	*1.3*	..	..	..	..	..	*26*	..	..	..
Hungary	*505*	16,729	*1.5*	19.9	*0.3*	9.0	*6.3*	4.6	*21*	49	34.6	28.6
India	38,600	279,093	12.2	25.7	6.9	38.6	65.9	14.1	2,435	5,644	6.8	76.5
Indonesia	8,080	54,659	7.1	17.3	3.5	7.5	75.8	3.8	125	333	33.3	69.7
Iran, Islamic Rep.	*34,300*	*9,700*	..	*8.5*	..	*1.0*	*30.4*	*11.3*	*97*	*316*	..	..
Iraq	..	..	..	..	..	..	..	..	..	..	..	..
Ireland	..	*59,938*	..	49.4	..	27.1	..	*50.5*	..	*62*	..	..
Israel	3,320	75,719	6.3	43.8	10.5	53.3	95.8	5.9	216	576	–26.6	59.5
Italy	149,000	*477,075*	13.5	40.3	3.9	45.6	26.8	*109.1*	220	*295*	..	..
Jamaica	911	8,500	19.8	74.2	0.7	1.8	3.4	0.3	44	39	40.0 [a]	–3.4 [a]
Japan	2,920,000	*2,126,075*	95.6	53.2	52.5	39.4	43.8	*71.0*	2,071	*3,058*	–10.1 [b]	37.8 [b]
Jordan	2,000	10,963	49.7	76.2	10.1	14.4	20.0	3.6	105	161	–2.1 [a]	65.4 [a]
Kazakhstan	..	*1,200*	..	*5.4*	..	*1.4*	..	*26.5*	..	*31*	..	..
Kenya	453	4,178	5.3	11.5	0.1	0.3	2.2	0.7	54	51	42.2 [a]	186.2 [a]
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	111,000	329,616	43.9	52.2	30.1	166.2	61.3	17.8	669	1,563	5.8	33.3
Kuwait	..	..	..	*56.1*	..	*11.4*	..	..	..	..	..	..
Kyrgyz Republic	..	..	..	..	..	..	..	..	..	..	..	..
Lao PDR	..	..	..	..	..	..	..	..	..	..	..	..
Latvia	..	1,141	..	8.5	..	1.5	..	5.0	..	56	–14.1 [a]	62.6 [a]
Lebanon	..	1,497	..	8.1	..	0.7	..	0.6	..	13	5.7	0.9 [a]
Lesotho	..	..	..	..	..	..	..	..	..	..	..	..
Liberia	..	..	..	..	..	..	..	..	..	..	..	..
Libya	..	..	..	..	..	..	..	..	..	..	..	..
Lithuania	..	3,510	..	10.6	..	1.3	..	0.8	..	48	25.7 [a]	117.9 [a]
Macedonia, FYR	..	*46*	..	*1.3*	..	*0.1*	..	*4.3*	..	*2*	..	..
Madagascar	..	..	..	..	..	..	..	..	..	..	..	..
Malawi	..	*156*	..	*9.2*	..	*1.3*	..	*13.8*	..	*8*	..	..
Malaysia	48,600	168,376	110.4	130.7	24.7	29.1	24.6	3.3	282	897	–2.6	25.5
Mali	..	..	..	..	..	..	..	..	..	..	..	..
Mauritania	..	*1,090*	..	*113.3*	..	..	..	..	..	*40*	..	..
Mauritius	268	1,955	11.2	29.3	0.3	1.3	*1.9*	0.3	13	40	22.9 [a]	43.7 [a]
Mexico	32,700	122,532	12.4	16.2	4.6	4.4	44.0	1.5	199	159	–16.4	30.4
Moldova	..	*350*	..	*23.7*	..	*14.2*	..	*60.1*	..	*22*	..	..
Mongolia	..	..	..	..	..	..	..	..	..	..	..	..
Morocco	966	13,152	3.7	23.8	0.2	1.6	..	0.9	71	53	–8.1	44.0
Mozambique	..	..	..	..	..	..	..	..	..	..	..	..
Myanmar	..	..	..	..	..	..	..	..	..	..	..	..
Namibia	*21*	308	*0.7*	5.9	..	0.0	..	0.0	*3*	13	22.5	37.1 [a]
Nepal	..	..	..	*14.6*	..	*0.6*	..	..	..	..	..	..
Netherlands	120,000	*401,465*	40.8	96.1	13.7	110.6	29.0	*123.7*	260	*180*	..	..
New Zealand	8,840	*21,745*	20.3	37.1	4.4	12.8	17.3	*38.3*	171	*149*	..	..
Nicaragua	..	..	..	..	..	..	..	..	..	..	..	..
Niger	..	..	..	..	..	..	..	..	..	..	..	..
Nigeria	1,370	9,494	4.8	13.2	0.0	1.1	0.9	0.9	131	200	–0.3 [a]	57.5 [a]
Norway	26,100	*67,300*	22.5	35.3	12.1	25.7	54.4	*67.8*	112	*179*	..	..
Oman	*1,060*	5,014	*9.4*	19.7	*0.9*	2.6	12.3	2.1	55	96	31.8	47.0 [a]
Pakistan	2,850	16,579	7.1	17.3	0.6	44.1	8.7	40.1	487	701	112.0 [a]	50.4 [a]
Panama	*226*	*2,600*	*3.4*	*21.6*	*0.0*	*0.4*	0.9	*1.7*	*13*	*29*	..	..
Papua New Guinea	..	..	..	..	..	..	..	..	..	..	..	..
Paraguay	..	..	..	..	..	..	..	..	..	..	..	..
Peru	812	16,055	3.1	23.7	0.4	2.0	*19.3*	0.5	294	197	33.5	88.1
Philippines	5,930	23,565	13.4	50.0	2.7	4.0	13.6	0.9	153	234	–19.7	41.4
Poland	*144*	37,165	*0.2*	15.2	*0.0*	3.1	*89.7*	2.2	*9*	203	2.2	29.5
Portugal	9,200	*42,846*	12.9	35.2	2.4	16.7	16.9	*52.4*	181	*63*	..	..
Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..

5.4 Stock markets

	Market capitalization				Market liquidity		Turnover ratio		Listed domestic companies		S&P/IFC Investable index	
	$ millions		% of GDP		value traded as % of GDP		value of shares traded as % of market capitalization		number		% change in price index	
	1990	2003	1990	2002	1990	2002	1990	2003	1990	2003	2002	2003
Romania	..	5,584	..	10.0	..	0.9	..	0.5	..	4,484	96.7 [a]	42.5 [a]
Russian Federation	*244*	230,786	*0.0*	35.8	..	10.4	..	3.0	*13*	214	34.8	68.5
Rwanda	..	..	..	..	..	..	..	..	..	..	..	..
Saudi Arabia	*48,200*	157,302	*36.7*	39.7	*1.7*	18.9	..	10.3	*59*	70	3.8 [a]	49.5 [a]
Senegal	..	..	..	..	..	..	..	..	..	..	..	..
Serbia and Montenegro	..	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	..	..	..	..	..	..	..	..	..	..	..	..
Singapore	34,300	*101,900*	92.9	117.2	55.0	64.5	..	*39.3*	150	*434*	..	..
Slovak Republic	..	2,779	..	8.0	..	3.3	..	1.9	..	306	23.6 [a]	57.2 [a]
Slovenia	..	5,209	..	21.0	..	0.5	..	1.4	*24*	32	78.3 [a]	42.1 [a]
Somalia	..	..	..	..	..	..	..	..	..	..	..	..
South Africa	138,000	267,745	123.2	177.5	7.3	75.6	..	3.6	732	426	44.9	37.6
Spain	111,000	*461,559*	21.8	70.7	8.0	155.3	..	*211.1*	427	*2,986*	..	..
Sri Lanka	917	2,711	11.4	10.1	0.5	1.9	5.8	1.2	175	244	28.4 [a]	35.6 [a]
Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Swaziland	17	*127*	1.9	*10.0*	..	*0.6*	..	*6.7*	1	*5*	..	..
Sweden	97,900	*177,065*	39.8	73.7	7.1	90.9	14.9	*96.2*	258	*278*	..	..
Switzerland	160,000	*553,758*	70.0	207.1	*29.6*	245.6	..	*100.5*	182	*258*	..	..
Syrian Arab Republic	..	..	..	..	..	..	..	..	..	..	..	..
Tajikistan	..	..	..	..	..	..	..	..	..	..	..	..
Tanzania	..	*398*	..	*4.3*	..	*0.1*	..	*1.9*	..	*4*	..	..
Thailand	23,900	120,887	28.0	36.3	26.8	37.5	92.6	18.2	214	405	18.3	147.2
Togo	..	..	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	696	10,605	13.7	67.6	1.1	1.8	10.0	0.6	30	35	33.2 [a]	46.7 [a]
Tunisia	533	2,464	4.3	10.1	0.2	1.1	3.3	0.9	13	46	–2.5 [a]	14.9 [a]
Turkey	19,100	68,379	12.7	18.5	3.9	38.5	42.5	28.5	110	284	–33.5	113.2
Turkmenistan	..	..	..	..	..	..	..	..	..	..	..	..
Uganda	..	*36*	..	*0.6*	..	..	..	..	..	*2*	..	..
Ukraine	..	4,303	..	7.5	..	0.3	..	0.5	..	149	26.7 [a]	40.3 [a]
United Arab Emirates	..	*7,881*	..	*11.4*	..	0.0	..	*3.4*	..	*12*	..	..
United Kingdom	849,000	*1,864,134*	85.8	119.0	28.2	173.7	33.4	*135.4*	1,701	*1,701*	–16.5 [c]	26.3 [c]
United States	3,060,000	*11,052,403*	53.2	106.4	30.5	244.4	53.4	*202.5*	6,599	*5,685*	–23.4 [d]	26.4 [d]
Uruguay	..	*153*	..	*0.8*	..	*0.0*	..	*0.5*	36	*15*	..	..
Uzbekistan	..	..	..	*0.6*	..	*0.2*	..	..	..	..	..	..
Venezuela, RB	8,360	3,820	17.2	4.2	4.6	0.1	43.0	0.6	76	54	–35.1 [a]	14.3 [a]
Vietnam	..	..	..	..	..	..	..	..	..	..	..	..
West Bank and Gaza	..	*723*	..	*17.9*	..	*1.9*	..	*10.3*	..	*24*	..	..
Yemen, Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Zambia	..	*217*	..	*6.0*	..	*1.3*	..	*22.5*	..	*9*	..	..
Zimbabwe	2,400	4,975	27.3	187.9	0.6	29.9	2.9	1.2	57	81	97.9 [a]	–74.8 [a]
World	**9,403,525 s**	***23,359,484* s**	**48.0 w**	**74.6 w**	**28.5 w**	**122.8 w**	**57.1 w**	**123.0 w**	**25,424 s**	***47,576* s**		
Low income	54,623	*197,220*	9.8	22.6	4.7	27.5	53.8	139.6	3,446	*7,322*		
Middle income	320,160	*1,639,528*	*20.0*	35.3	*5.2*	16.0	..	44.1	4,231	*13,307*		
Lower middle income	212,666	*1,099,924*	*15.5*	36.6	*9.0*	20.8	..	56.3	3,146	*10,725*		
Upper middle income	107,494	*539,604*	*29.6*	33.0	*6.1*	7.1	*50.3*	23.2	1,085	*2,582*		
Low & middle income	374,783	*1,836,748*	*18.8*	33.3	*5.2*	17.8	..	57.8	7,677	*20,629*		
East Asia & Pacific	86,510	*702,100*	*16.4*	40.4	*6.6*	24.4	*118.1*	72.7	774	*3,132*		
Europe & Central Asia	19,100	*234,597*	*2.2*	22.7	..	12.3	..	53.6	110	*6,781*		
Latin America & Carib.	78,169	*418,720*	7.7	27.4	2.1	5.4	29.8	21.7	1,734	*1,381*		
Middle East & N. Africa	5,259	*124,210*	*27.4*	*26.1*	*2.2*	*6.0*	..	*19.6*	817	*1,585*		
South Asia	42,688	*144,070*	10.8	22.7	5.6	35.4	54.0	180.3	3,231	*6,839*		
Sub-Saharan Africa	143,057	*213,051*	*52.2*	*47.3*	..	*32.4*	..	*23.7*	1,011	*911*		
High income	9,028,742	*21,522,735*	51.6	83.4	31.4	145.2	59.4	*137.9*	17,747	*26,947*		
Europe EMU	1,183,500	*3,485,194*	21.7	52.4	14.2	67.4	..	*106.1*	2,630	*5,843*		

Note: Aggregates for market capitalization are unavailable for 2003; those shown refer to 2002.
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.

Stock markets 5.4

About the data

The development of an economy's financial markets is closely related to its overall development. Well functioning financial systems provide good and easily accessible information. That lowers transaction costs, which in turn improves resource allocation and boosts economic growth. Both banking systems and stock markets enhance growth, the main factor in poverty reduction. At low levels of economic development commercial banks tend to dominate the financial system, while at higher levels domestic stock markets tend to become more active and efficient relative to domestic banks.

Open economies with sound macroeconomic policies, good legal systems, and shareholder protection attract capital and therefore have larger financial markets. Recent research on stock market development shows that new communications technology and increased financial integration have resulted in more cross-border capital flows, a stronger presence of financial firms around the world, and the migration of stock exchange activities to international exchanges. Many firms in emerging markets now cross-list on international exchanges, which provides them with lower cost capital and more liquidity-traded shares. However, this also means that exchanges in emerging markets may not have enough financial activity to sustain them, putting pressure on them to rethink their operations.

The stock market indicators in the table include measures of size (market capitalization, number of listed domestic companies) and liquidity (value traded as a percentage of gross domestic product, value of shares traded as a percentage of market capitalization). 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 entry and exit restrictions, the existence of a securities and exchange commission, and the quality of laws to protect investors, may influence the functioning of stock markets but are not included in the table.

Stock market size can be measured in a number of ways, and each may produce a different ranking of 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 transaction costs. (High turnover indicates low transaction 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/IFCG index is intended to represent the most active stocks in the markets it covers and to be the broadest possible indicator of market movements. The S&P/IFCI index, which applies the same calculation methodology as the S&P/IFCG index, is 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.

Standard & Poor's Emerging Markets Data Base, the source for all the data in the table, provides regular updates on 54 emerging stock markets encompassing more than 2,200 stocks. The S&P/IFCG index includes 34 markets and more than 1,900 stocks, and the S&P/IFCI index covers 30 markets and close to 1,200 stocks. These indexes 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.

About the data is based on Demirgüç-Kunt and Levine (1996a), Beck and Levine (2001), and Claessens, Klingebiel, and Schmukler (2002).

Definitions

• **Market capitalization** (also known as market value) is the share price times the number of shares outstanding. • **Market liquidity** is the total value traded divided by GDP. Value traded is 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 2003,* which draws on the Emerging Markets Data Base, 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.

5.5 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		Risk premium on lending	
	% of GDP		% of GDP		% of GDP		%		Lending minus deposit rate percentage points		Prime lending rate minus treasury bill rate percentage points	
	1990	2002	1990	2002	1990	2002	1990	2002	1990	2002	1990	2002
Afghanistan	..	..	..	..	..	..	..	..	..	..	..	..
Albania	..	43.6	..	61.5	..	38.9	..	10.5	*2.1*	6.8	..	5.8
Algeria	74.5	*29.1*	73.5	*49.0*	24.8	*19.7*	1.3	*12.5*	..	3.3	..	6.7
Angola	..	5.5	..	22.2	..	15.3	..	14.5	..	48.6	..	..
Argentina	32.4	62.4	11.5	27.9	7.1	18.9	7.4	9.5	..	12.4	..	..
Armenia	*58.7*	7.3	*79.9*	15.6	*42.9*	7.1	*13.6*	11.4	..	11.5	..	6.4
Australia	71.4	*93.9*	55.0	*71.0*	43.2	*47.6*	1.5	*1.2*	4.5	5.0	4.0	*3.3*
Austria	121.4	124.3	..	..	..	..	2.1	..	..	..	..	..
Azerbaijan	*65.9*	8.7	*38.6*	13.3	*13.4*	6.7	*4.5*	10.2	..	8.7	..	3.3
Bangladesh	23.9	40.2	23.4	39.1	16.8	29.8	12.8	8.6	4.0	7.8	..	..
Belarus	..	17.5	..	15.4	..	10.1	..	7.7	..	10.0	..	..
Belgium	73.1	115.4	..	..	..	..	0.2	..	6.9	5.1	3.4	4.5
Benin	22.4	5.8	26.7	26.6	5.9	7.1	29.3	20.9	9.0	..	..	..
Bolivia	30.7	62.3	24.5	49.1	18.0	40.7	18.8	5.8	18.0	11.1	..	8.2
Bosnia and Herzegovina	..	35.8	..	46.3	..	19.1	..	10.5	..	8.2	..	..
Botswana	–46.0	–29.6	21.9	28.5	13.6	20.9	11.0	3.8	1.8	5.7	..	..
Brazil	89.8	64.8	26.4	33.1	18.5	25.0	7.6	23.6	..	43.7	..	43.4
Bulgaria	*118.5*	23.7	*71.9*	41.9	*53.6*	24.8	*10.2*	8.9	*8.9*	6.6	*8.6*	*6.5*
Burkina Faso	12.1	12.7	18.8	18.2	6.6	7.0	12.7	6.8	9.0	..	..	..
Burundi	23.2	35.1	18.2	22.3	6.5	7.3	2.8	3.9	..	..	..	..
Cambodia	..	6.0	..	18.4	..	13.2	..	71.3	..	13.7	..	..
Cameroon	31.2	16.3	22.6	20.2	10.1	8.0	3.4	28.0	11.0	13.0	..	..
Canada	82.3	92.6	74.3	78.4	59.8	54.4	1.6	0.6	4.2	3.4	1.3	1.6
Central African Republic	12.9	13.2	15.3	14.4	1.8	1.4	2.8	2.5	11.0	13.0	..	..
Chad	11.5	10.9	14.6	13.5	0.6	0.8	3.3	25.2	11.0	13.0	..	..
Chile	73.0	77.6	40.8	40.0	32.8	30.0	3.6	3.0	8.5	4.0	..	..
China	90.0	166.4	79.2	178.3	41.4	108.9	15.7	12.1	0.7	3.3	..	..
Hong Kong, China	154.9	144.5	*179.4*	238.9	*164.7*	219.8	0.1	0.2	3.3	4.7	*2.7*	3.7
Colombia	35.9	36.5	29.8	31.8	19.3	21.2	27.4	6.7	8.8	7.4	..	..
Congo, Dem. Rep.	25.3	0.2	12.9	4.8	2.1	1.8	49.0	6.2	..	..	..	..
Congo, Rep.	29.1	11.4	22.0	13.9	6.1	1.0	2.0	17.0	11.0	13.0	..	..
Costa Rica	29.9	36.9	42.7	39.8	30.0	25.9	68.5	12.3	11.4	15.0	..	..
Côte d'Ivoire	44.5	20.7	28.8	29.4	10.9	7.9	2.1	6.2	9.0	..	..	..
Croatia	..	63.8	..	65.7	..	48.2	..	14.3	*499.3*	11.0	..	..
Cuba	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	..	45.8	..	75.5	..	39.2	..	3.8	..	4.0	..	3.5
Denmark	63.0	156.6	59.0	51.0	29.4	19.4	1.1	1.2	6.2	4.7	..	..
Dominican Republic	31.5	44.8	28.6	39.5	13.3	28.5	31.2	18.8	*15.2*	9.5	..	..
Ecuador	15.5	*28.0*	21.1	*24.8*	11.6	*15.6*	22.6	*3.3*	–6.0	9.6	..	..
Egypt, Arab Rep.	106.8	109.9	87.9	94.1	60.7	74.5	17.1	17.1	7.0	4.5	..	8.3
El Salvador	32.0	49.4	30.6	42.7	19.6	35.1	27.3	9.5	3.2	*4.6*	..	..
Eritrea	..	148.9	..	152.5	..	86.0	..	24.1	..	..	..	..
Estonia	*66.7*	49.6	*136.0*	42.0	*95.2*	16.8	*43.1*	9.6	..	4.0	..	..
Ethiopia	66.8	58.0	42.2	52.9	12.6	26.5	24.0	13.6	3.6	4.6	3.0	7.4
Finland	82.8	64.7	54.3	..	..	..	4.1	..	4.1	3.3	..	..
France	104.4	105.0	..	..	..	..	1.0	..	6.1	3.6	0.4	*2.7*
Gabon	20.0	18.8	17.8	17.3	6.6	7.3	2.0	8.9	11.0	13.0	..	..
Gambia, The	3.4	26.3	20.7	45.1	8.8	20.4	8.8	13.7	15.2	11.3	..	..
Georgia	..	19.6	..	11.7	..	5.6	..	14.4	..	22.0	..	–11.6
Germany	104.4	144.7	69.6	..	..	..	3.2	..	4.5	7.0	3.5	6.7
Ghana	17.5	31.9	14.1	30.7	3.4	14.2	20.2	11.2	..	..	..	..
Greece	99.3	109.5	..	..	..	..	13.9	*17.2*	8.1	4.7	3.6	3.9
Guatemala	17.4	15.7	21.2	30.6	11.8	18.1	31.8	22.0	5.1	9.9	..	..
Guinea	*6.0*	12.5	*9.2*	13.0	*1.1*	2.3	6.2	27.5	0.2	*11.9*	..	*4.7*
Guinea-Bissau	77.5	16.1	68.9	60.9	4.4	0.9	10.8	17.2	13.1	..	..	..
Haiti	34.3	37.3	32.6	42.8	16.6	28.8	74.9	40.0	..	17.4	..	18.1

Financial depth and efficiency 5.5

	Domestic credit provided by banking sector		Liquid liabilities		Quasi-liquid liabilities		Ratio of bank liquid reserves to bank assets		Interest rate spread		Risk premium on lending	
	% of GDP		% of GDP		% of GDP		%		Lending minus deposit rate percentage points		Prime lending rate minus treasury bill rate percentage points	
	1990	2002	1990	2002	1990	2002	1990	2002	1990	2002	1990	2002
Honduras	40.9	34.2	33.6	56.8	18.8	43.6	6.7	23.0	8.3	8.9	..	..
Hungary	105.5	53.0	43.8	47.2	19.0	27.8	11.2	5.2	4.1	2.8	–1.4	1.3
India	51.5	58.5	43.1	63.2	28.1	45.7	14.8	5.6	..	..	..	..
Indonesia	45.5	59.5	40.4	54.9	29.1	43.2	4.2	11.1	3.3	3.4	..	..
Iran, Islamic Rep.	70.8	47.6	57.6	44.5	31.1	25.6	66.0	26.8	..	..	..	..
Iraq	..	..	..	..	..	..	..	..	..	..	..	..
Ireland	55.2	110.6	44.5	..	..	..	4.8	..	5.0	3.7	0.4	..
Israel	106.2	93.6	70.2	104.6	63.6	96.7	11.9	8.9	12.0	3.9	11.4	2.5
Italy	89.4	99.6	70.5	..	..	..	12.0	..	7.3	4.3	1.7	2.5
Jamaica	32.2	27.6	47.2	49.3	35.0	33.7	37.4	22.3	6.6	9.9	4.3	3.0
Japan	259.6	312.5	182.3	201.5	155.3	132.0	1.6	3.7	3.4	1.8	..	..
Jordan	117.9	90.4	131.2	120.2	77.8	85.7	20.5	27.1	2.2	5.8	..	..
Kazakhstan	..	13.0	..	19.2	..	9.1	..	4.4	..	..	..	..
Kenya	52.9	43.2	43.3	42.6	29.3	27.2	9.9	8.2	5.1	13.0	4.0	9.5
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	65.7	116.9	54.6	103.7	45.7	93.1	6.3	2.6	0.0	1.8	..	..
Kuwait	*243.0*	105.8	*192.2*	89.8	*153.9*	70.6	*1.2*	1.1	0.0	3.3	0.0	..
Kyrgyz Republic	..	11.4	..	14.7	..	4.4	..	11.3	..	18.9	..	14.7
Lao PDR	5.1	12.6	7.2	19.6	3.1	16.4	3.4	26.5	*2.5*	23.3	..	7.9
Latvia	..	39.6	..	36.5	..	16.3	..	5.9	..	4.7	..	4.5
Lebanon	132.6	196.1	193.7	217.9	170.9	208.1	3.9	18.8	23.1	5.5	21.1	5.7
Lesotho	32.8	10.7	39.2	28.8	22.6	9.7	23.0	6.2	7.4	11.9	4.1	5.8
Liberia	*319.5*	168.7	*101.9*	8.4	*20.8*	1.5	*67.3*	56.3	0.0	14.0	..	..
Libya	104.1	50.3	68.1	41.3	13.7	9.0	26.4	24.0	1.5	4.0	1.5	1.5
Lithuania	..	18.3	..	29.3	..	12.8	..	10.9	..	5.1	..	3.1
Macedonia, FYR	..	15.9	..	28.6	..	17.3	..	7.5	..	8.8	..	..
Madagascar	26.2	18.4	17.8	24.3	5.3	5.5	8.5	23.3	5.3	13.3	..	*15.0*
Malawi	19.7	14.3	20.2	16.2	10.8	7.4	32.9	23.0	8.9	22.5	8.1	8.8
Malaysia	75.7	154.2	118.0	128.5	97.8	103.0	5.9	12.5	1.3	3.2	1.1	3.7
Mali	13.7	16.4	20.5	26.6	5.5	5.8	50.8	18.0	9.0	..	..	..
Mauritania	54.7	–8.3	28.5	16.0	7.0	5.0	6.1	4.0	5.0	..	..	..
Mauritius	48.4	77.1	67.9	87.2	52.7	73.9	8.8	5.1	5.4	11.1	..	..
Mexico	36.6	26.6	22.8	24.5	16.4	14.5	4.3	11.1	..	4.4	..	1.1
Moldova	*62.8*	29.7	*70.3*	30.5	*35.4*	14.4	*8.3*	16.5	..	9.3	..	17.6
Mongolia	*73.4*	17.1	*56.2*	37.8	*14.7*	22.7	*2.0*	15.8	..	15.2	..	..
Morocco	60.1	84.5	61.0	89.4	18.4	21.0	11.3	8.1	0.5	8.6	..	..
Mozambique	15.6	13.2	26.5	32.7	5.2	19.0	61.5	14.2	..	8.7	..	*–2.0*
Myanmar	32.8	*35.1*	27.9	*33.5*	7.8	*13.1*	286.7	16.8	2.1	5.5	..	..
Namibia	20.3	49.0	24.3	40.2	14.2	18.3	4.4	2.9	*10.6*	6.0	*6.3*	2.8
Nepal	28.9	*43.2*	32.2	*51.5*	18.5	*34.9*	12.7	22.2	2.5	*2.9*	6.5	*2.7*
Netherlands	103.6	160.4	..	..	..	..	0.3	..	8.4	1.2	..	..
New Zealand	80.6	118.2	77.0	89.2	64.0	74.4	0.8	0.5	4.4	4.5	2.2	4.3
Nicaragua	206.6	93.0	56.9	40.3	23.1	34.4	20.2	30.9	12.5	15.8	..	..
Niger	16.2	8.5	19.8	9.0	8.3	2.7	42.9	19.0	9.0	..	..	..
Nigeria	23.7	25.3	23.6	30.5	10.3	12.4	11.9	17.9	5.5	8.1	*6.9*	5.7
Norway	89.0	54.0	59.5	55.7	26.8	8.8	0.5	4.7	4.6	2.1	..	..
Oman	16.6	40.3	28.9	35.4	19.3	25.5	6.9	4.2	1.4	5.7	..	..
Pakistan	50.9	43.5	39.8	54.8	10.0	23.9	8.9	9.0	..	..	..	..
Panama	52.7	90.7	41.1	76.4	33.0	65.6	..	..	3.6	5.6	..	..
Papua New Guinea	35.7	26.3	35.2	30.2	24.0	15.3	3.2	9.6	6.9	8.1	4.1	3.0
Paraguay	14.9	29.3	22.3	36.7	13.7	28.0	31.0	24.1	8.1	15.8	..	..
Peru	20.2	23.9	24.8	32.4	11.8	21.3	22.0	25.4	2,335.0	10.5	..	..
Philippines	26.9	60.5	37.0	63.0	28.4	51.1	20.9	8.5	4.6	4.5	0.4	3.6
Poland	19.5	36.2	34.0	42.7	17.2	28.1	20.6	5.6	462.5	5.9	*–5.0*	*3.4*
Portugal	69.4	149.9	..	..	..	..	29.0	..	7.8	..	8.3	..
Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..

5.5 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		Risk premium on lending	
									Lending minus deposit rate		Prime lending rate minus treasury bill rate	
	% of GDP		% of GDP		% of GDP		%		percentage points		percentage points	
	1990	2002	1990	2002	1990	2002	1990	2002	1990	2002	1990	2002
Romania	79.7	13.2	60.4	24.7	32.7	19.2	1.2	61.7	..	..	..	..
Russian Federation	..	26.6	..	26.2	..	12.4	..	13.9	..	10.8	..	3.0
Rwanda	17.1	11.1	14.9	17.3	7.0	8.8	4.3	9.9	6.3	..	..	..
Saudi Arabia	52.7	70.1	42.9	54.0	19.6	25.3	5.6	10.0	..	..	..	..
Senegal	33.8	22.6	22.9	27.6	9.7	11.6	14.1	15.9	9.0	..	..	..
Serbia and Montenegro	..	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	36.3	48.4	18.1	22.9	3.6	7.9	64.1	9.0	12.0	13.9	5.0	7.0
Singapore	75.2	84.8	122.7	115.8	99.9	92.8	3.7	2.5	2.7	4.5	3.7	4.6
Slovak Republic	..	52.8	..	65.3	..	42.5	..	5.2	..	3.6	..	..
Slovenia	*36.8*	46.0	*34.2*	55.6	*25.8*	42.7	*2.7*	4.0	*142.0*	4.9	..	4.4
Somalia	..	..	..	..	..	..	..	..	..	..	..	..
South Africa	97.8	150.9	44.6	50.1	27.2	18.3	3.3	2.7	2.1	5.0	3.2	4.6
Spain	107.0	129.6	..	..	..	..	8.7	..	5.4	1.8	1.8	1.0
Sri Lanka	38.0	43.6	34.9	39.3	22.6	30.5	9.9	8.1	–6.4	4.0	–1.1	0.7
Sudan	20.4	11.7	20.1	15.8	2.9	5.9	79.5	19.9	..	..	..	..
Swaziland	7.5	5.6	28.3	20.9	19.8	14.3	21.5	7.1	5.8	7.2	3.4	6.7
Sweden	135.9	*75.2*	50.7	..	..	..	1.9	*0.4*	6.8	*3.7*	3.0	*1.9*
Switzerland	179.0	174.4	145.2	157.9	118.6	112.0	1.1	0.9	–0.9	3.5	–0.9	3.0
Syrian Arab Republic	56.6	26.7	54.7	79.2	10.5	31.7	46.0	9.1	5.0	5.0	..	..
Tajikistan	..	21.3	..	8.4	..	3.2	..	11.0	..	5.0	..	..
Tanzania	34.6	10.0	19.9	23.0	6.3	12.4	5.3	13.0	0.0	13.1	..	12.9
Thailand	91.1	116.0	74.9	114.5	66.0	102.1	3.1	3.4	2.2	4.9	..	..
Togo	21.3	17.0	36.1	24.3	19.1	8.9	59.0	16.9	9.0	..	..	..
Trinidad and Tobago	58.5	41.5	54.6	51.8	42.7	38.7	13.5	13.4	6.9	7.7	5.4	7.7
Tunisia	62.5	74.4	51.5	60.0	26.7	37.0	1.6	3.4	..	..	..	..
Turkey	19.5	59.3	24.1	49.8	16.4	44.5	16.4	9.0	..	..	..	..
Turkmenistan	..	*30.7*	..	*20.4*	..	*8.9*	..	*6.7*	..	..	..	..
Uganda	*17.8*	15.4	7.6	20.2	1.4	9.4	15.2	9.8	7.4	13.5	–2.3	13.2
Ukraine	*83.2*	28.1	*50.1*	29.1	*9.0*	10.9	*49.0*	9.0	..	17.4	..	..
United Arab Emirates	34.7	47.6	46.3	66.6	37.7	48.6	4.4	9.3	..	..	..	..
United Kingdom	121.2	145.3	..	..	..	..	0.5	0.3	2.2	..	0.7	0.1
United States	110.8	159.4	65.5	70.0	49.4	54.2	2.4	1.1	..	..	2.5	3.1
Uruguay	46.7	93.0	58.1	72.5	51.5	67.0	31.2	12.4	76.6	*37.4*	..	..
Uzbekistan	..	..	..	..	..	..	..	..	..	..	..	..
Venezuela, RB	37.4	15.0	38.8	17.8	29.4	7.8	21.9	23.2	7.7	7.6	..	..
Vietnam	*4.7*	44.8	*22.7*	53.0	*9.3*	29.6	*25.3*	6.3	..	2.6	..	3.1
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	60.6	–0.5	55.1	37.4	10.4	19.9	121.2	16.5	..	4.7	..	6.2
Zambia	67.8	46.7	21.8	22.3	10.6	14.0	33.7	22.8	9.4	21.9	9.2	10.7
Zimbabwe	41.7	58.7	41.8	61.3	30.3	24.8	12.2	18.8	2.9	18.1	3.3	8.0
World	**121.2 w**	**150.7 w**	**83.3 w**	**97.5 w**	**.. w**	**68.6 w**	**10.3 m**	**10.3 m**	**5.4 m**	**7.0 m**	**.. m**	**.. m**
Low income	44.7	48.6	36.9	52.1	22.0	35.6	12.8	15.1	7.4	13.0	..	..
Middle income	65.3	82.9	42.3	79.0	24.5	50.3	14.6	9.5	5.0	6.7	..	..
Lower middle income	75.0	100.7	48.8	97.4	28.7	61.9	17.9	9.3	*5.6*	8.4	..	..
Upper middle income	45.5	49.1	29.1	43.8	16.1	28.2	9.9	9.6	6.2	5.6	..	..
Low & middle income	60.9	76.9	41.2	74.2	24.0	47.7	13.2	11.3	6.6	8.7	..	..
East Asia & Pacific	76.4	143.8	63.1	150.6	37.2	97.0	5.1	12.1	2.2	4.9	..	..
Europe & Central Asia	..	36.9	..	39.3	..	24.9	..	9.9	..	8.2	..	..
Latin America & Carib.	59.1	42.7	25.2	29.8	17.6	20.2	22.3	18.8	8.2	9.9	..	..
Middle East & N. Africa	70.4	72.9	59.0	67.3	26.9	40.2	14.2	16.5	2.2	5.0	..	..
South Asia	48.8	55.3	41.0	59.8	25.2	42.0	12.7	8.6	2.5	*7.3*	..	..
Sub-Saharan Africa	56.9	65.5	32.1	36.2	16.8	15.4	11.9	13.7	8.2	13.0	..	..
High income	132.1	168.5	92.9	*105.6*	..	*78.7*	2.0	1.2	4.6	3.8	2.4	*3.5*
Europe EMU	99.5	123.0	..	..	..	..	4.1	..	6.5	3.7	2.6	*3.5*

Financial depth and efficiency 5.5

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. These funds come from savings: savers accumulate claims on financial institutions, which pass the funds to their final users. But even if a country has savings, growth may not materialize—because the financial system may fail to direct the savings to where they can be invested most efficiently. Enabling it to do so requires established payments systems, the availability of 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, the indirect lending by savers to investors becomes more efficient and gradually increases financial assets relative to gross domestic product (GDP). More specialized savings and financial institutions emerge and more financing instruments become available, spreading risks and reducing costs to liability holders. Securities markets mature, allowing savers to invest their resources directly in financial assets issued by firms. Financial systems vary widely across countries: banks, nonbank financial institutions, 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 on the 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 are 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 bonds, commercial paper, and certificates of deposit—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 transaction 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 (although if governments set interest rates, the spreads become less reliable measures of efficiency). The risk premium on lending can be approximated by the spread between the lending rate to the private sector (line 60p in the International Monetary Fund's International Financial Statistics, or IFS) and the "risk free" treasury bill interest rate (IFS line 60c). A small spread indicates that the market considers its best corporate customers to be low risk. 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.

The accuracy of financial data depends on the quality of accounting systems, which are weak in some developing countries. Some 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 for small farmers, small businesses, and 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 include bank deposits of generally less than one year plus currency. Liquid liabilities 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. The ratio of liquid liabilities 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. • **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. • **Risk premium on lending** is the interest rate charged by banks on loans to prime private sector customers minus the "risk free" treasury bill interest rate at which short-term government securities are issued or traded in the market. In some countries this spread may be negative, indicating that the market considers its best corporate clients to be lower risk than the government.

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*.

5.6 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]		
										Individual		Corporate
	% of GDP	% of total taxes		% of value added in industry and services		% of tax revenue		% of tax revenue		%	on income over $	%
	2002	1990	2002	1990	2002	1990	2002	1990	2002	2003	2003	2003
Afghanistan	..	..	..	..	..	..	..	..	..	..	..	..
Albania	..	..	..	..	..	..	..	..	..	..	..	..
Algeria	*32.0*	..	*77.9*	..	*3.4*	..	0.0	..	12.1	..	..	..
Angola	..	..	..	..	..	..	..	..	..	..	..	..
Argentina	*12.5*	2.7	*19.9*	2.2	*5.5*	9.3	0.2	2.6	4.5	35	36,697	35
Armenia	14.6	..	18.3	..	5.7	..	0.0	..	4.9	20	..	20
Australia	..	70.9	..	5.9	..	0.1	..	4.4	..	47	35,149	30
Austria	..	20.8	..	10.0	..	0.0	..	1.6	..	50	48,698	34
Azerbaijan	..	..	..	..	..	..	..	..	..	35	12,257	25
Bangladesh	..	..	..	0.0	..	..	..	..	..	..	..	..
Belarus	*26.6*	*12.1*	*10.3*	*17.1*	*13.5*	3.6	..	0.4	..	..	..	..
Belgium	..	36.1	..	11.5	..	0.0	..	0.0	..	50	28,596	39
Benin	..	..	..	..	..	..	..	..	..	..	..	..
Bolivia	*13.8*	7.9	*8.7*	5.6	*11.2*	0.0	0.0	11.1	6.4	13	..	25
Bosnia and Herzegovina	..	..	..	..	..	..	..	..	..	..	..	..
Botswana	..	71.7	..	1.0	..	0.0	..	24.7	..	25	18,560	15
Brazil	..	24.5	..	7.1	..	0.0	..	2.5	..	28	7,251	15
Bulgaria	*25.2*	40.6	*17.0*	9.9	*16.2*	0.0	0.0	2.5	2.6	29	3,982	24
Burkina Faso	..	24.7	..	4.0	..	1.1	..	33.1	..	..	..	..
Burundi	..	*23.4*	..	0.0	..	3.1	..	23.2	..	..	..	..
Cambodia	..	..	..	..	..	..	..	..	..	20	38,462	20
Cameroon	..	25.1	..	4.3	..	1.7	..	18.9	..	..	..	..
Canada	*19.3*	59.1	*57.3*	4.0	..	0.0	0.0	3.2	1.4	29	65,206	38
Central African Republic	..	..	..	..	..	..	..	..	..	..	..	..
Chad	*7.2*	20.3	..	3.9	..	..	..	..	..	..	..	..
Chile	*18.7*	15.8	*24.7*	10.4	*13.0*	..	..	..	..	40	6,127	17
China	..	49.8	..	1.5	..	0.0	..	22.1	..	45	12,048	..
Hong Kong, China	..	..	..	..	..	..	..	..	..	17	13,462	18
Colombia	..	36.4	..	4.8	..	2.0	..	22.5	..	35	29,426	39
Congo, Dem. Rep.	*3.9*	28.5	*16.7*	2.6	*1.5*	4.1	1.0	45.1	33.7	50	6,056	40
Congo, Rep.	*10.5*	*40.2*	*16.0*	0.0	*6.5*	0.0	0.0	32.3	23.2	..	..	..
Costa Rica	*20.0*	11.5	*15.1*	8.7	*10.8*	8.0	0.2	18.2	4.2	30	16,860	30
Côte d'Ivoire	*16.3*	18.1	*21.0*	8.9	*4.8*	3.7	15.3	28.4	27.6	10	3,837	35
Croatia	*38.2*	*17.4*	*8.7*	*9.6*	*24.9*	0.0	0.0	3.6	6.8	45	35,171	..
Cuba	..	..	..	..	..	..	..	..	..	..	..	..
Czech Republic	*32.1*	..	*21.1*	..	*11.3*	..	0.0	..	1.4	32	10,988	31
Denmark	*32.3*	43.5	*40.2*	18.9	*19.8*	0.0	0.0	0.1	0.0	59	..	30
Dominican Republic	*15.6*	23.8	*19.6*	3.1	*4.8*	0.1	0.0	41.4	44.1	25	16,637	25
Ecuador	..	62.9	..	4.7	..	0.3	..	12.1	..	25	54,400	25
Egypt, Arab Rep.	..	26.4	..	4.1	..	0.0	..	18.9	..	32	10,823	40
El Salvador	*10.0*	..	*18.6*	0.0	*0.8*	..	0.0	..	7.3	..	..	..
Eritrea	..	..	..	..	..	..	..	..	..	..	..	..
Estonia	*27.2*	*27.5*	*14.7*	*14.8*	*15.0*	0.0	0.0	0.8	0.2	26	803	35
Ethiopia	15.3	40.9	39.4	9.1	5.4	2.8	0.4	18.0	41.4	35	..	30
Finland	..	34.5	..	17.5	..	0.0	..	1.0	..	36	52,843	29
France	..	18.7	..	13.1	..	0.0	..	0.0	..	..	..	33
Gabon	..	35.9	..	5.0	..	2.8	..	23.4	..	50	..	..
Gambia, The	..	13.7	..	12.2	..	0.2	..	45.6	..	..	..	..
Georgia	10.4	..	3.8	..	9.4	..	0.0	..	7.7	..	..	..
Germany	..	17.5	..	6.9	..	0.0	..	0.0	..	49	52,659	27
Ghana	..	25.1	..	6.8	..	12.4	..	28.7	..	30	5,647	33
Greece	..	23.3	..	14.5	..	0.0	..	0.1	..	40	22,402	35
Guatemala	..	..	..	..	..	..	..	..	..	31	38,028	31
Guinea	..	12.6	..	3.2	..	51.7	..	11.2	..	..	..	..
Guinea-Bissau	..	..	..	..	..	..	..	..	..	..	..	..
Haiti	..	..	..	..	..	..	..	..	..	..	..	..

Tax policies 5.6

	Tax revenue	Taxes on income, profits, and capital gains		Domestic taxes on goods and services		Export duties		Import duties		Highest marginal tax rate[a]		
										Individual		Corporate
	% of GDP	% of total taxes		% of value added in industry and services		% of tax revenue		% of tax revenue		%	on income over $	%
	2002	1990	2002	1990	2002	1990	2002	1990	2002	2003	2003	2003
Honduras	..	..	..	..	..	..	..	..	..	..	..	..
Hungary	*33.6*	21.2	*23.7*	22.6	*15.2*	1.3	0.0	5.6	2.5	40	5,999	18
India	*9.9*	18.6	*37.4*	7.4	*5.5*	0.1	0.1	35.8	24.1	30	3,139	37
Indonesia	*13.6*	65.4	*48.0*	5.5	*6.5*	0.1	0.3	6.6	4.6	35	22,371	30
Iran, Islamic Rep.	*8.5*	24.7	*41.7*	1.0	*1.6*	0.0	0.0	18.6	14.4	35	125,345	25
Iraq	..	..	..	..	..	..	..	..	..	..	..	..
Ireland	..	39.7	..	15.5	..	0.0	..	0.0	..	42	26,805	16
Israel	*36.2*	42.4	*45.2*	..	..	0.0	0.0	1.4	0.7	50	50,886	36
Italy	..	37.7	..	12.7	..	0.0	..	0.0	..	45	67,011	34
Jamaica	*26.1*	*41.5*	*39.0*	0.0	*11.8*	0.0	0.0	14.0	9.3	25	2,363	33
Japan	..	73.0	..	2.4	..	0.0	..	1.4	..	37	148,478	30
Jordan	*19.0*	22.9	*16.4*	6.8	*10.6*	0.0	0.0	34.7	20.4	..	..	..
Kazakhstan	*9.6*	..	*28.9*	..	*7.1*	..	0.3	..	5.7	30	39,185	30
Kenya	..	32.9	..	15.9	..	0.0	..	17.8	..	30	5,720	30
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	..	37.5	..	6.7	..	0.0	..	13.0	..	36	66,644	27
Kuwait	..	19.5	..	0.0	..	0.0	..	76.8	..	0	..	..
Kyrgyz Republic	*12.4*	..	*21.9*	..	*16.0*	..	..	..	..	..	..	..
Lao PDR	..	..	..	..	..	..	..	..	..	..	..	..
Latvia	*24.0*	..	*15.4*	..	*12.9*	..	0.0	..	1.3	25	..	19
Lebanon	..	..	..	..	..	..	..	..	..	..	..	..
Lesotho	..	12.7	..	13.0	..	0.2	..	63.6	..	..	..	..
Liberia	..	..	..	..	..	..	..	..	..	..	..	..
Libya	..	..	..	..	..	..	..	..	..	..	..	..
Lithuania	*22.5*	*22.2*	*11.9*	*16.4*	*14.3*	..	0.0	..	1.3	33	..	15
Macedonia, FYR	33.0	..	12.8	..	18.3	..	..	..	7.9	18	..	15
Madagascar	*11.3*	15.7	*15.7*	3.4	*5.2*	8.5	0.0	50.1	53.5	..	..	..
Malawi	..	42.5	..	13.9	..	0.0	..	18.7	..	..	..	..
Malaysia	..	42.5	..	6.3	..	9.7	..	15.1	..	28	65,789	28
Mali	..	..	..	..	..	..	..	..	..	..	..	..
Mauritania	..	..	..	..	..	..	..	..	..	..	..	..
Mauritius	*17.3*	15.2	*14.0*	7.0	*9.2*	4.6	0.0	45.7	29.3	25	862	25
Mexico	*13.2*	34.2	*38.1*	10.2	*10.5*	0.1	0.0	6.9	4.5	35	61,689	34
Moldova	20.5	..	2.6	..	18.2	..	0.0	..	5.6	..	..	..
Mongolia	*23.0*	*28.2*	*10.5*	*9.3*	*18.2*	0.0	0.4	19.6	9.8	..	..	..
Morocco	..	27.3	..	12.1	..	0.3	..	20.3	..	44	5,243	35
Mozambique	..	..	..	..	..	..	..	..	..	32	42,583	32
Myanmar	*3.0*	29.8	*34.5*	6.8	*4.0*	0.0	0.0	23.3	7.2	..	..	..
Namibia	*29.7*	39.4	*35.3*	9.9	*8.6*	3.6	..	26.9	..	36	17,241	35
Nepal	9.6	13.0	20.8	6.6	7.1	0.4	2.4	37.0	31.3	..	..	..
Netherlands	..	33.6	..	11.5	..	0.0	..	0.0	..	52	47,352	35
New Zealand	*27.9*	62.2	*68.3*	13.2	..	0.0	0.0	2.5	1.8	39	31,561	33
Nicaragua	*16.5*	20.0	*14.7*	16.9	*11.3*	0.0	0.0	21.3	8.4	..	..	..
Niger	..	..	..	..	..	..	..	..	..	..	..	..
Nigeria	..	..	..	..	..	..	..	..	..	..	..	..
Norway	..	21.7	..	16.8	..	0.1	..	0.6	..	..	..	28
Oman	*7.4*	87.6	*77.1*	0.3	..	0.0	0.0	7.8	10.3	0	..	12
Pakistan	12.9	12.8	31.1	8.6	8.4	0.0	0.0	44.4	10.8	35	11,111	45
Panama	*14.1*	24.4	*29.4*	4.8	..	1.3	0.0	15.8	..	30	200,000	30
Papua New Guinea	..	47.0	..	5.0	..	2.1	..	29.3	..	47	24,842	25
Paraguay	*10.1*	12.4	*16.1*	3.6	*8.1*	0.0	0.0	18.8	17.5	0	..	30
Peru	*13.6*	5.8	*25.1*	8.2	*9.7*	7.6	0.0	9.9	10.5	30	45,863	27
Philippines	*13.3*	32.5	*45.6*	6.4	*4.7*	0.0	0.0	28.4	19.6	32	9,320	32
Poland	*26.2*	..	*18.8*	0.0	*13.1*	..	0.0	..	2.1	40	18,278	27
Portugal	..	25.7	..	13.0	..	0.0	..	2.6	..	40	50,045	30
Puerto Rico	..	..	..	..	..	..	..	..	..	33	50,000	20

5.6 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]		
										Individual		Corporate
	% of GDP	% of total taxes		% of value added in industry and services		% of tax revenue		% of tax revenue		%	on income over $	%
	2002	1990	2002	1990	2002	1990	2002	1990	2002	2003	2003	2003
Romania	*22.8*	21.0	*12.0*	16.0	*10.6*	0.0	0.0	0.6	3.4	40	3,743	25
Russian Federation	*22.5*	..	*10.8*	..	*11.3*	..	11.2	..	5.1	13	..	24
Rwanda	..	20.0	..	5.5	..	7.4	..	20.7	..	..	..	..
Saudi Arabia	..	..	..	..	..	..	..	..	..	0	..	0
Senegal	17.9	..	*22.8*	0.0	*7.4*	..	..	..	..	..	..	..
Serbia and Montenegro	..	..	..	..	..	..	..	..	..	..	..	..
Sierra Leone	..	33.0	..	2.1	..	0.4	..	41.3	..	..	..	..
Singapore	*15.4*	44.6	*52.7*	..	*5.1*	0.0	0.0	3.5	2.6	22	184,438	22
Slovak Republic	*29.6*	..	*19.7*	..	*10.9*	..	0.0	..	1.3	38	14,087	25
Slovenia	*35.0*	*12.3*	*15.5*	*12.7*	*16.6*	..	0.0	..	1.8	50	..	25
Somalia	..	..	..	..	..	..	..	..	..	..	..	..
South Africa	*26.3*	55.0	*57.0*	10.3	*10.3*	0.0	0.0	3.9	2.9	40	30,380	30
Spain	..	34.0	..	7.5	..	0.0	..	1.7	..	29	44,794	35
Sri Lanka	*14.5*	12.0	*16.9*	14.7	*13.6*	4.2	0.0	27.4	12.7	30	3,708	30
Sudan	..	..	..	..	..	..	..	..	..	..	..	..
Swaziland	*26.7*	33.2	*26.4*	5.2	*6.6*	2.0	0.0	50.5	54.7	33	4,215	30
Sweden	..	20.6	..	14.5	..	0.0	..	0.6	..	25	50,767	28
Switzerland	*23.5*	17.0	*17.7*	..	*6.7*	0.0	0.0	6.9	1.1	..	..	9
Syrian Arab Republic	..	40.2	..	9.6	..	1.3	..	8.2	..	..	..	..
Tajikistan	*10.5*	..	*3.0*	..	*9.4*	..	0.0	..	17.1	..	..	..
Tanzania	..	..	..	..	..	..	..	..	..	30	7,074	30
Thailand	*14.4*	26.2	*34.3*	8.8	*7.8*	0.2	0.3	23.7	12.3	37	92,379	30
Togo	..	..	..	..	..	..	..	..	..	..	..	..
Trinidad and Tobago	..	..	..	0.0	..	..	..	..	..	30	7,937	30
Tunisia	*26.0*	16.0	*22.3*	7.1	*12.5*	0.4	0.1	35.1	12.5	..	..	..
Turkey	*24.2*	51.2	*42.2*	5.9	*15.4*	0.0	0.0	7.3	1.1	40	73,417	30
Turkmenistan	..	..	..	..	..	..	..	..	..	..	..	..
Uganda	*10.8*	..	*20.1*	0.0	*5.3*	..	0.0	..	50.3	30	2,860	30
Ukraine	*21.7*	..	*14.3*	..	*10.5*	..	0.0	..	4.4	40	3,826	30
United Arab Emirates	..	0.0	..	0.6	..	..	..	..	..	0	..	0
United Kingdom	..	43.2	..	11.3	..	0.0	..	0.0	..	40	48,413	30
United States	17.7	56.1	55.5	0.7	*0.7*	0.0	0.0	1.7	1.0	39	311,950	35
Uruguay	*23.3*	7.1	*16.5*	9.4	*10.4*	0.6	0.1	8.1	3.0	0	..	35
Uzbekistan	..	..	..	..	..	..	..	..	..	32	561	20
Venezuela, RB	*12.2*	82.2	*34.0*	0.8	*5.9*	0.0	0.0	7.1	12.1	34	72,000	34
Vietnam	16.4	..	32.0	..	9.0	..	0.0	..	22.8	..	..	32
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	..	44.9	..	2.5	..	0.0	..	29.2	..	..	..	..
Zambia	..	..	..	..	..	..	..	..	..	30	368	35
Zimbabwe	..	49.7	..	8.4	..	0.0	..	18.8	..	45	26,249	30

a. These data are from PricewaterhouseCoopers's *Individual Taxes: Worldwide Summaries 2003–2004* and *Corporate Taxes: Worldwide Summaries 2003–2004,* copyright 2003 by PricewaterhouseCoopers by permission of John Wiley and Sons, Inc.

Tax policies 5.6

About the data

Taxes are 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 economy's competitiveness.

Taxes are compulsory transfers to governments from individuals, businesses, or institutions. They include service fees that are clearly out of proportion to the costs of providing the services but exclude fines, penalties, and compulsory social security contributions. Taxes 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 gross domestic product (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 in local currencies are normalized by scaling values in the same units to ease cross-country comparisons. The table shows only 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 revenue to GDP may reflect weak administration and large-scale tax avoidance or evasion. Low ratios may also reflect the presence of a sizable parallel economy with unrecorded and undisclosed incomes. Tax revenue 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 economies 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. Seeing this pattern, some of the fastest growing economies have lowered import tariffs in recent years. The simple mean import tariff in India, for example, declined from almost 80 percent in 1990 to about 30 percent in 2001. 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 levied at the national level on individual and corporate income. Figures for individual marginal tax rates generally refer to employment income. In some countries the highest marginal tax rate is also the basic or flat rate, and other surtaxes, deductions, and the like may apply. And in many countries several different corporate tax rates may be levied, depending on the type of business (mining, banking, insurance, agriculture, manufacturing), ownership (domestic or foreign), volume of sales, or whether surtaxes or exemptions are included. The corporate tax rates in the table are mainly general rates applied to domestic companies. For more detailed information, see the country's laws, regulations, and tax treaties.

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; profits of businesses, estates, and trusts; and capital gains and losses. 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** are 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 multistage taxes (where *stage* refers to stage of production or distribution), excise taxes, motor vehicle taxes, and taxes on the extraction, processing, or production of minerals or other products. • **Export duties** are 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 these taxes, not from amounts receivable from export duties. • **Import duties** are all levies collected on goods at the point of entry into the country. They include levies imposed for revenue or protection purposes and 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 national level schedule of tax rates applied to the annual taxable income of individuals and corporations. Also presented are the income levels for individuals above which the highest marginal tax rates levied at the national level apply.

Data sources

The definitions used here are from the International Monetary Fund's (IMF) *Manual on Government Finance Statistics* (2002). 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 2003–2004* and *Corporate Taxes: Worldwide Summaries 2003–2004*.

5.7 Relative prices and exchange rates

	Exchange rate arrangements [a]		Official exchange rate	Purchasing power parity (PPP) conversion factor		Ratio of PPP conversion factor to official exchange rate	Real effective exchange rate	Interest rate		
	Classification	Structure	local currency units to $	local currency units to international $			index	%		
	2002	2002	2002	1990	2002	2002	2002	Deposit 2002	Lending 2002	Real 2002
Afghanistan	MF	U	3,000.00	..	..	..	..	..	..	..
Albania	IF	U	140.15	2.0	44.5	0.3	..	8.5	15.3	8.7
Algeria	MF	U	79.68	5.0	24.7	0.3	101.7	5.3	8.5	7.4
Angola	MF	U	43.53	0.0	17.5	0.4	..	48.7	97.3	–2.9
Argentina	MF	U	3.06	0.3	0.8	0.2	..	39.2	51.7	16.2
Armenia	IF	U	573.35	..	141.9	0.2	95.9	9.6	21.1	18.5
Australia	IF	U	1.84	1.4	1.4	0.7	96.1	3.0	8.0	5.5
Austria	Euro	U	1.06	0.9	0.9	0.9	92.1	..	..	..
Azerbaijan	MF	U	4,860.82	*1.1*	1,127.8	0.2	..	8.7	17.4	16.5
Bangladesh	P	U	57.89	9.6	11.9	0.2	..	8.2	16.0	12.4
Belarus	P	U	1,790.92	..	465.9	0.3	..	26.9	36.9	–3.6
Belgium	Euro	U	1.06	0.9	0.9	0.9	90.2	2.6	7.7	5.8
Benin	EA/Euro	U	696.99	160.7	267.2	0.4	..	3.5	..	..
Bolivia	P	U	7.17	1.3	2.6	0.4	115.4	9.6	20.6	17.5
Bosnia and Herzegovina	CB/Euro	U	2.08	..	..	..	..	4.5	12.7	10.4
Botswana	P/Euro	D	6.33	1.2	2.4	0.4	..	10.3	16.0	9.9
Brazil	IF	U	2.92	0.0	1.0	0.3	..	19.1	62.9	50.1
Bulgaria	CB/Euro	U	2.08	0.0	0.6	0.3	135.6	2.8	9.3	5.3
Burkina Faso	EA/Euro	U	696.99	136.3	168.0	0.2	..	3.5	..	..
Burundi	MF	U	930.75	49.6	149.3	0.2	79.1	..	19.5	5.8
Cambodia	MF	D	3,912.08	..	610.5	0.2	..	2.5	16.2	12.8
Cameroon	EA/Euro	U	696.99	171.8	210.9	0.3	102.1	5.0	18.0	17.2
Canada	IF	U	1.57	1.3	1.2	0.8	97.7	0.8	4.2	3.2
Central African Republic	EA/Euro	U	696.99	136.0	162.6	0.2	95.4	5.0	18.0	16.3
Chad	EA/Euro	U	696.99	106.1	163.6	0.2	..	5.0	18.0	13.8
Chile	IF	U	688.94	149.5	288.7	0.4	90.7	3.8	7.8	5.0
China	P	U	8.28	1.2	1.8	0.2	121.4	2.0	5.3	5.6
Hong Kong, China	CB	U	7.80	6.4	6.9	0.9	..	0.3	5.0	8.2
Colombia	IF	U	2,504.24	120.6	727.5	0.3	90.4	8.9	16.3	9.7
Congo, Dem. Rep.	IF	U	346.48	0.0	58.7	0.2	109.2	..	66.8	35.3
Congo, Rep.	EA/Euro	U	696.99	387.9	587.7	0.8	..	5.0	18.0	18.8
Costa Rica	P	U	359.82	32.8	173.8	0.5	109.4	11.5	26.4	15.8
Côte d'Ivoire	EA/Euro	U	696.99	168.0	324.3	0.5	103.7	3.5	..	..
Croatia	MF	U	7.87	..	3.9	0.5	103.7	1.9	12.8	9.6
Cuba	..	..	..	..	..	..	..	..	..	..
Czech Republic	MF	U	32.74	*8.1*	14.1	0.4	133.6	2.2	6.2	3.5
Denmark	P	U	7.89	8.1	8.2	1.0	96.7	2.4	7.1	6.2
Dominican Republic	MF	D	18.61	2.6	7.0	0.4	112.1	16.5	26.1	18.4
Ecuador	EA/Other	U	1.00	0.4	0.5	0.5	113.8	5.5	15.1	2.9
Egypt, Arab Rep.	MF	U	4.50	0.8	1.5	0.3	..	9.3	13.8	9.4
El Salvador	EA/Other	U	8.75	2.4	4.0	0.5	..	*9.3*	*14.0*	*10.5*
Eritrea	P	U	13.96	*1.2*	2.3	0.2	..	..	..	..
Estonia	CB/Euro	U	16.61	0.1	6.5	0.4	..	2.7	6.7	2.5
Ethiopia	MF	U	8.57	0.7	1.0	0.1	79.4	4.1	8.7	16.9
Finland	Euro	U	1.06	1.0	1.0	1.0	90.2	1.5	4.8	3.5
France	Euro	U	1.06	1.0	0.9	0.9	89.8	3.0	6.6	4.7
Gabon	EA/Euro	U	696.99	341.2	399.5	0.6	91.4	5.0	18.0	11.4
Gambia, The	MF	U	19.92	1.8	3.0	0.2	68.4	12.7	24.0	3.6
Georgia	IF	U	2.20	..	0.6	0.3	..	9.8	31.8	23.9
Germany	Euro	U	1.06	1.0	0.9	0.9	86.6	2.7	9.7	8.0
Ghana	MF	U	7,932.70	94.9	1,134.2	0.1	81.0	16.2	..	..
Greece	Euro	U	1.06	0.4	0.7	0.7	100.0	2.8	7.4	3.6
Guatemala	MF	U	7.82	1.4	3.7	0.5	..	6.9	16.9	8.2
Guinea	P	U	1,975.84	225.0	390.8	0.2	..	7.4	*19.4*	*7.4*
Guinea-Bissau	EA/Euro	U	696.99	11.0	137.8	0.2	..	3.5	..	..
Haiti	MF	U	29.25	1.2	7.2	0.2	..	8.2	25.7	15.3

Relative prices and exchange rates

5.7

	Exchange rate arrangements [a]		Official exchange rate	Purchasing power parity (PPP) conversion factor		Ratio of PPP conversion factor to official exchange rate	Real effective exchange rate	Interest rate		
	Classification	Structure	local currency units to $	local currency units to international $			index		%	
	2002	2002	2002	1990	2002	2002	1995 = 100 2002	Deposit 2002	Lending 2002	Real 2002
Honduras	P	U	16.43	1.3	6.1	0.4	..	13.7	22.7	15.5
Hungary	P	U	257.89	22.3	124.8	0.5	130.8	7.4	10.2	–0.5
India	MF	U	48.61	4.9	8.8	0.2	..	..	11.9	8.7
Indonesia	MF	U	9,311.19	642.6	2,357.7	0.3	..	15.5	18.9	11.0
Iran, Islamic Rep.	MF	D	6,906.96	180.4	1,963.4	0.3	198.1	..	..	..
Iraq	MF	U	0.31	..	..	..	..	..	..	..
Ireland	Euro	U	1.06	0.8	0.9	0.9	99.0	0.1	3.8	–2.7
Israel	P	U	4.74	1.8	3.8	0.8	102.5	6.0	9.9	5.2
Italy	Euro	U	1.06	0.7	0.8	0.8	110.0	1.4	5.8	2.9
Jamaica	MF	U	48.42	4.4	36.6	0.8	..	8.6	18.5	9.7
Japan	IF	U	125.39	190.2	146.2	1.2	78.9	0.0	1.9	3.6
Jordan	P	U	0.71	0.3	0.3	0.4	..	4.4	10.2	9.7
Kazakhstan	MF	U	153.28	..	43.2	0.3	..	..	..	..
Kenya	MF	U	78.75	9.1	30.4	0.4	..	5.5	18.5	9.0
Korea, Dem. Rep.	..	..	..	..	..	..	..	..	..	..
Korea, Rep.	IF	U	1,251.09	563.7	738.7	0.6	..	4.9	6.8	5.0
Kuwait	P	U	0.30	*0.3*	0.3	0.9	..	3.2	6.5	3.0
Kyrgyz Republic	MF	U	46.94	..	9.3	0.2	..	5.9	24.8	22.0
Lao PDR	MF	D	10,056.33	174.9	1,884.2	0.2	..	6.0	29.3	18.4
Latvia	p	U	0.62	..	0.2	0.4	..	3.2	8.0	6.1
Lebanon	P	U	1,507.50	307.0	1,346.0	0.9	..	11.0	16.6	13.8
Lesotho	P	U	10.54	1.0	1.7	0.2	60.8	5.2	17.1	7.4
Liberia	IF	U	61.75	..	..	..	..	6.2	20.2	–7.1
Libya	P	U	1.27	..	..	..	..	3.0	7.0	..
Lithuania	CB/Euro	U	3.68	..	1.4	0.4	..	1.7	6.8	6.9
Macedonia, FYR	P	U	64.35	..	18.5	0.3	72.6	9.6	18.4	14.3
Madagascar	IF	U	6,831.96	516.0	2,456.7	0.4	..	12.0	25.3	8.6
Malawi	IF	U	76.69	1.4	23.3	0.3	115.0	28.1	50.5	28.1
Malaysia	P	U	3.80	1.5	1.6	0.4	91.3	3.2	6.4	2.7
Mali	EA/Euro	U	696.99	141.4	222.8	0.3	..	3.5	..	..
Mauritania	MF	U	271.74	36.5	42.7	0.2	..	..	..	..
Mauritius	MF	U	29.96	6.5	10.5	0.3	..	9.9	21.0	15.1
Mexico	IF	U	9.66	1.5	6.8	0.7	..	3.8	8.2	3.4
Moldova	MF	U	13.57	..	3.5	0.3	100.2	14.2	23.5	14.3
Mongolia	MF	U	1,110.31	2.9	296.8	0.3	..	13.2	28.4	21.1
Morocco	P	U	11.02	3.2	3.5	0.3	103.4	4.5	13.1	12.5
Mozambique	IF	U	23,677.96	321.5	4,406.7	0.2	..	18.0	26.7	13.9
Myanmar	MF	D	6.57	..	..	..	..	9.5	15.0	*–6.2*
Namibia	P	U	10.54	0.9	2.5	0.2	..	7.8	13.8	4.0
Nepal	P	U	77.88	6.8	12.7	0.2	..	*4.8*	*7.7*	*4.3*
Netherlands	Euro	U	1.06	0.9	0.9	0.9	95.8	2.8	4.0	0.7
New Zealand	IF	U	2.16	1.6	1.5	0.7	88.9	5.3	9.8	8.0
Nicaragua	P	U	14.25	0.0	4.3	0.3	111.6	7.3	23.2	17.0
Niger	EA/Euro	U	696.99	122.3	165.4	0.2	..	3.5	..	..
Nigeria	MF	M	120.58	3.8	46.2	0.4	90.3	16.7	24.8	11.8
Norway	IF	U	7.98	8.0	9.2	1.1	107.9	6.5	8.5	10.0
Oman	P	U	0.38	0.3	0.2	0.6	..	2.9	8.5	6.6
Pakistan	MF	U	59.72	5.8	12.9	0.2	90.0	..	..	..
Panama	EA/Other	U	1.00	0.6	0.7	0.7	..	5.0	10.6	9.3
Papua New Guinea	IF	U	3.90	0.5	0.9	0.2	81.2	5.8	13.9	1.5
Paraguay	MF	U	5,716.26	408.1	1,240.2	0.2	75.6	22.9	38.7	21.0
Peru	IF	U	3.52	0.1	1.5	0.4	..	4.2	14.7	14.1
Philippines	IF	U	51.60	5.6	12.1	0.2	85.6	4.6	9.1	4.1
Poland	IF	U	4.08	0.2	1.9	0.5	133.4	6.2	12.1	10.3
Portugal	Euro	U	1.06	0.5	0.7	0.7	100.6	..	..	..
Puerto Rico	..	..	..	0.7	*0.7*	..	..	..	..	..

5.7 Relative prices and exchange rates

	Exchange rate arrangements [a]		Official exchange rate	Purchasing power parity (PPP) conversion factor		Ratio of PPP conversion factor to official exchange rate	Real effective exchange rate	Interest rate		
	Classification	Structure	local currency units to $	local currency units to international $			index	%		
	2002	2002	2002	1990	2002	2002	1995 = 100 2002	Deposit 2002	Lending 2002	Real 2002
Romania	P	U	33,055.43	6.9	10,344.3	0.3	110.2	..	..	..
Russian Federation	MF	U	31.35	..	9.2	0.3	109.0	5.0	15.7	0.4
Rwanda	MF	U	476.33	31.4	79.5	0.2	..	8.0	..	..
Saudi Arabia	P	U	3.74	2.9	2.5	0.7	107.2	2.2	..	..
Senegal	EA/Euro	U	696.99	185.8	222.2	0.3	..	3.5	..	..
Serbia and Montenegro	MF	U	..	..	..	..	..	..	..	..
Sierra Leone	IF	D	2,099.03	30.0	599.7	0.3	94.1	8.2	22.2	17.6
Singapore	MF	U	1.79	1.9	1.6	0.9	93.7	0.9	5.4	5.2
Slovak Republic	MF	U	45.33	5.9	15.5	0.3	105.8	6.6	10.2	6.1
Slovenia	P	U	240.25	..	144.9	0.6	..	8.2	13.2	4.7
Somalia	IF	D	..	..	..	..	..	..	..	..
South Africa	IF	U	10.54	1.0	2.4	0.2	62.6	10.8	15.8	6.6
Spain	Euro	U	1.06	0.6	0.8	0.7	98.3	2.5	4.3	–0.1
Sri Lanka	MF	U	95.66	10.3	23.4	0.2	..	9.2	13.2	4.5
Sudan	P	U	263.31	0.7	59.8	0.2	..	..	..	..
Swaziland	P	U	10.54	0.9	2.5	0.2	..	8.0	15.3	1.5
Sweden	IF	U	9.74	9.9	10.1	1.0	89.8	*2.2*	*5.8*	*4.5*
Switzerland	IF	U	1.56	2.0	1.9	1.2	93.1	0.4	3.9	3.5
Syrian Arab Republic	P	M	11.23	10.3	16.9	1.5	..	4.0	9.0	4.4
Tajikistan	MF	U	2.76	..	0.5	0.2	..	9.2	14.2	–6.4
Tanzania	IF	U	966.58	76.0	444.9	0.5	..	3.3	16.4	11.8
Thailand	MF	U	42.96	10.8	12.6	0.3	..	2.0	6.9	6.1
Togo	EA/Euro	U	696.99	94.5	137.1	0.2	105.4	3.5	..	..
Trinidad and Tobago	MF	U	6.25	3.1	4.9	0.8	126.6	4.8	12.5	11.6
Tunisia	P	U	1.42	0.4	0.5	0.3	96.2	..	..	..
Turkey	IF	U	1,507,226.38	1,643.1	621,572.8	0.4	..	50.5	..	..
Turkmenistan	P	D	*5,200.00*	..	*1,544.1*	*0.3*	..	..	..	..
Uganda	IF	U	1,797.55	111.4	298.4	0.2	76.7	5.6	19.1	23.1
Ukraine	P	U	5.33	..	0.9	0.2	112.4	7.9	25.3	21.4
United Arab Emirates	P	U	3.67	3.4	..	..	..	..	*8.1*	..
United Kingdom	IF	U	0.67	0.6	0.7	1.0	130.4	..	4.0	0.8
United States	IF	U	1.00	1.0	1.0	1.0	133.6	..	4.7	3.5
Uruguay	IF	U	21.26	0.6	10.0	0.5	87.9	*14.3*	126.1	90.3
Uzbekistan	MF	M	*236.61*	..	177.4	*0.4*	..	..	..	..
Venezuela, RB	P	U	1,160.95	24.7	810.6	0.7	132.9	29.0	36.6	3.8
Vietnam	MF	U	15,279.50	644.4	2,892.2	0.2	..	6.4	9.1	4.8
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	IF	U	175.63	20.4	108.3	0.6	..	13.0	17.7	11.9
Zambia	MF	U	4,398.60	18.7	1,893.0	0.4	115.8	23.3	45.2	21.1
Zimbabwe	P	U	55.04	1.0	*16.4*	*0.3*	..	18.4	36.5	–34.2

a. Exchange rate arrangements are given for the end of the year in 2002. Exchange rate classifications include independent floating (IF), managed floating (MF), pegged (P), currency board (CB), and several exchange arrangements (EA): Euro that the currency is pegged to the euro, 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).

Relative prices and exchange rates 5.7

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 a host of other prices in the economy. 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.) Also see *Statistical methods* for information on alternative conversion factors used in the Atlas method of calculating gross national income (GNI) per capita in U.S. dollars.

The official or market exchange rate is often used to compare prices in different currencies. Since 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. Since identical volumes of goods and services in different countries correspond to different values (and vice versa) when official exchange rates are used, an alternative method of comparing prices across countries has been developed. In this method national currency estimates of GNI are converted to a common unit of account 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 Program 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.

The ratio of the PPP conversion factor to the official exchange rate (also referred to as the national price level) makes it possible to compare the cost of the bundle of goods that make up gross domestic product (GDP) across countries. These national price levels vary systematically, rising with GNI per capita.

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 in 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 before 1990 take into account trade in manufactured and primary products in 1980–82, the weights from January 1990 onward take into account trade in 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.

Many interest rates coexist in an economy, reflecting competitive conditions, the terms governing 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).

Definitions

• **Exchange rate arrangements** describe the arrangements furnished to the IMF by each member country under article IV, section 2(a) of the IMF's Articles of Agreement. • **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 (currency is pegged to the French franc, or another country's currency is used as legal tender). • **Structure** shows whether countries have a unitary exchange rate or dual or multiple rates. • **Official exchange rate** is the exchange rate determined by national authorities or 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 (PPP) 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. • **Ratio of PPP conversion factor to official exchange rate** is the result obtained by dividing the PPP conversion factor by the official exchange rate. • **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.

Data sources

The information on exchange rate arrangements is from the IMF's *Exchange Arrangements and Exchange Restrictions Annual Report, 2003.* 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 real interest rates are calculated using World Bank data on the GDP deflator.

5.8 Defense expenditures and arms transfers

	Military expenditures				Armed forces personnel				Arms transfers			
	% of GDP		% of central government expenditure		Total thousands		% of labor force		$ millions 1990 prices Exports		Imports	
	1992	2002	1992	2002	1992	1999	1992	1999	1992	2002	1992	2002
Afghanistan	..	..	..	..	45	..	0.6	..	..	..	..	31
Albania	4.6	1.2	..	*3.7*	65	18	4.1	1.2	..	..	..	0
Algeria	2.2	3.7	*9.5*	*0.0*	126	120	1.6	1.2	..	..	16	464
Angola	12.0	3.7	..	..	128	100	2.8	1.8	20	1	*106*	5
Argentina	1.4	1.2	12.0	*8.1*	65	73	0.5	0.5	*15*	*3*	16	210
Armenia	2.2	2.7	..	..	20	50	1.2	3.2	..	..	*8*	*2*
Australia	2.3	1.7	8.9	*7.5*	68	55	0.8	0.6	4	30	250	614
Austria	1.0	0.8	2.4	*2.0*	44	49	1.2	1.3	13	124	2	79
Azerbaijan	3.3	2.1	*12.4*	*10.2*	43	75	1.4	2.1	..	..	64	*3*
Bangladesh	1.1	1.1	..	*11.2*	107	110	0.2	0.2	..	..	63	21
Belarus	1.5	*1.4*	4.1	*4.5*	102	65	1.9	1.2	*8*	*333*	..	*41*
Belgium	1.8	1.3	3.7	*3.2*	79	42	1.9	1.0	*20*	14	64	29
Benin	..	..	..	..	7	8	0.3	0.3	..	..	..	..
Bolivia	2.1	1.7	10.6	*6.1*	32	33	1.2	1.0	..	..	24	*1*
Bosnia and Herzegovina	..	*9.5*	..	..	60	30	3.2	1.7	..	..	*0*	*25*
Botswana	4.3	4.0	11.7	..	7	8	1.2	1.1	..	..	3	*12*
Brazil	1.1	1.6	3.7	*5.2*	296	300	0.4	0.4	61	18	66	154
Bulgaria	2.7	2.7	6.6	*7.9*	99	70	2.3	1.7	18	20	44	*6*
Burkina Faso	2.3	1.7	14.0	..	9	9	0.2	0.2	..	..	..	..
Burundi	3.6	7.6	10.7	*27.1*	13	40	0.4	1.1	..	..	..	*1*
Cambodia	4.7	2.7	..	..	135	60	2.7	1.0	*0*	..	*2*	*22*
Cameroon	1.5	1.4	8.4	*10.4*	12	15	0.2	0.2	..	..	3	*1*
Canada	1.9	1.1	6.9	*6.2*	82	60	0.5	0.4	210	318	344	359
Central African Republic	1.6	..	..	..	4	3	0.3	0.2	..	..	1	..
Chad	*2.7*	1.4	..	..	38	30	1.3	0.8	..	..	*8*	*15*
Chile	3.4	2.9	16.2	*12.4*	92	88	1.8	1.4	1	1	182	56
China	2.7	2.5	32.5	*19.2*	3,160	2,400	0.5	0.3	642	818	1,163	2,307
Hong Kong, China	..	..	..	..	..	..	..	..	..	..	..	..
Colombia	2.4	3.7	15.8	*18.8*	139	155	0.9	0.9	..	..	32	119
Congo, Dem. Rep.	..	..	..	..	45	55	0.3	0.3	..	..	2	14
Congo, Rep.	..	..	..	..	10	10	0.9	0.7	..	..	..	*0*
Costa Rica	..	..	..	..	8	10	0.6	0.7	..	..	*3*	..
Côte d'Ivoire	1.4	*0.9*	*4.0*	*3.7*	15	15	0.3	0.2	..	..	1	7
Croatia	7.6	2.5	19.1	*5.9*	103	60	4.6	2.9	..	*2*	24	2
Cuba	..	..	..	..	175	50	3.5	0.9	..	..	..	..
Czech Republic	*2.3*	*2.1*	*6.2*	*5.4*	*107*	54	*1.9*	0.9	*265*	85	..	53
Denmark	1.9	1.6	4.8	*4.3*	28	27	1.0	0.9	*190*	9	42	7
Dominican Republic	..	..	..	..	22	30	0.7	0.8	..	..	..	*13*
Ecuador	2.7	*2.1*	16.9	..	57	58	1.5	1.2	..	..	*14*	1
Egypt, Arab Rep.	3.6	2.7	10.5	*10.2*	424	430	2.2	1.8	10	*25*	995	638
El Salvador	2.0	*0.8*	..	*31.2*	49	15	2.4	0.6	..	..	3	*3*
Eritrea	*21.4*	*27.5*	..	..	*55*	215	*3.2*	10.8	..	..	*14*	180
Estonia	0.5	1.9	2.2	*5.6*	3	7	0.4	0.9	..	..	1	1
Ethiopia	2.7	5.2	19.3	*43.0*	120	300	0.5	1.1	..	..	..	20
Finland	1.9	1.2	4.6	*4.4*	33	35	1.3	1.3	3	12	441	24
France	3.4	2.5	7.6	*6.4*	522	421	2.1	1.6	845	1,617	387	22
Gabon	..	*0.3*	..	..	7	7	1.4	1.2	..	..	..	..
Gambia, The	1.0	0.9	..	..	1	1	0.2	0.2	..	..	..	..
Georgia	..	0.6	..	4.9	*25*	14	*0.9*	0.5	..	*108*	*4*	*80*
Germany	2.1	1.5	6.3	*4.7*	442	331	1.1	0.8	1,134	745	969	16
Ghana	0.6	*0.6*	3.6	..	7	7	0.1	0.1	..	..	*10*	*9*
Greece	4.5	4.3	15.5	*15.6*	208	204	4.8	4.5	15	*11*	1,994	567
Guatemala	1.3	0.6	..	..	44	30	1.4	0.7	..	..	*10*	*1*
Guinea	1.9	*1.7*	9.0	*8.5*	15	12	0.5	0.3	..	..	..	*5*
Guinea-Bissau	*0.3*	*3.1*	..	..	11	7	2.1	1.1	..	..	*1*	..
Haiti	..	..	..	..	8	0	0.3	0.0	..	..	..	..

Defense expenditures and arms transfers 5.8

	Military expenditures				Armed forces personnel				Arms transfers			
	% of GDP		% of central government expenditure		Total thousands		% of labor force		$ millions 1990 prices Exports		Imports	
	1992	2002	1992	2002	1992	1999	1992	1999	1992	2002	1992	2002
Honduras	..	..	..	..	17	8	0.9	0.3	..	..	..	..
Hungary	2.4	1.8	4.3	*4.4*	78	51	1.6	1.1	*21*	*24*	*1,021*	*14*
India	2.3	2.6	..	..	1,270	1,300	0.3	0.3	0	0	871	1,668
Indonesia	1.7	*1.1*	9.4	*4.6*	283	296	0.3	0.3	*20*	70	47	51
Iran, Islamic Rep.	1.9	*4.8*	11.2	*17.2*	528	460	3.2	2.4	1	*0*	386	298
Iraq	..	..	..	..	407	420	8.2	6.7	..	..	..	..
Ireland	1.2	0.7	3.0	*2.8*	13	14	1.0	0.9	..	*0*	*48*	20
Israel	10.5	8.6	21.6	*16.6*	181	173	8.8	6.6	68	178	1,330	226
Italy	2.0	1.9	3.9	*4.8*	471	391	1.9	1.5	368	490	42	308
Jamaica	..	..	..	..	3	3	0.2	0.2	..	..	..	*5*
Japan	0.9	1.0	4.5	..	242	240	0.4	0.4	13	*3*	1,523	154
Jordan	8.2	8.4	27.8	*26.5*	100	102	9.8	7.3	*73*	*5*	*1*	149
Kazakhstan	*1.0*	0.9	..	*6.8*	*15*	33	*0.2*	0.4	..	*9*	..	69
Kenya	1.9	1.6	7.9	*5.8*	24	24	0.2	0.2	..	..	3	*61*
Korea, Dem. Rep.	..	..	..	..	1,200	1,000	11.3	8.6	225	32	45	3
Korea, Rep.	3.4	2.7	20.6	*16.6*	750	665	3.6	2.8	*21*	22	497	229
Kuwait	31.8	11.2	31.5	*18.8*	12	21	2.1	2.5	..	*82*	897	27
Kyrgyz Republic	0.7	*1.7*	*3.2*	*9.7*	12	12	0.6	0.6	..	..	..	..
Lao PDR	..	*2.1*	..	..	37	50	1.7	2.0	..	..	..	*34*
Latvia	*0.8*	1.8	*3.4*	*3.9*	5	5	0.3	0.4	*8*	..	0	3
Lebanon	8.0	4.7	*25.7*	*14.0*	37	58	3.1	3.9	..	*45*	38	*4*
Lesotho	2.6	*3.1*	5.7	*6.4*	2	2	0.3	0.3	..	..	..	*6*
Liberia	10.6	..	..	..	2	..	0.2	..	..	..	..	*8*
Libya	..	..	..	..	85	85	6.6	5.8	*8*	11	..	*145*
Lithuania	*0.7*	2.0	*3.5*	*6.8*	10	12	0.5	0.7	..	3	74	7
Macedonia, FYR	..	2.8	..	..	10	16	1.1	1.7	..	..	*27*	*133*
Madagascar	1.2	*1.2*	6.6	*7.1*	21	20	0.4	0.3	..	..	..	..
Malawi	1.4	*0.8*	..	..	10	5	0.2	0.1	..	*1*	*1*	..
Malaysia	3.0	2.1	10.5	*10.6*	128	95	1.7	1.0	..	*8*	16	213
Mali	*2.4*	*2.0*	..	..	12	10	0.3	0.2	..	..	..	*7*
Mauritania	3.5	1.9	..	..	16	11	1.6	0.9	..	..	*27*	*9*
Mauritius	0.4	0.2	1.5	*0.8*	1	2	0.2	0.4	..	..	*6*	*1*
Mexico	0.5	0.5	3.3	*3.2*	175	255	0.5	0.6	..	..	12	19
Moldova	*0.5*	0.3	..	1.2	9	11	0.4	0.5	12	*5*	6	..
Mongolia	2.5	2.3	11.6	*7.5*	21	20	2.1	1.7	..	..	..	..
Morocco	4.3	*4.1*	14.4	*12.4*	195	195	2.1	1.7	..	..	30	169
Mozambique	5.1	2.5	..	..	50	8	0.6	0.1	..	..	..	*0*
Myanmar	3.4	*2.3*	30.1	*26.6*	286	345	1.3	1.4	..	..	52	208
Namibia	4.3	2.9	10.6	*9.1*	8	3	1.3	0.4	..	..	*14*	11
Nepal	0.9	1.4	6.4	8.6	35	35	0.4	0.3	..	..	..	8
Netherlands	2.4	1.6	4.7	*4.0*	90	54	1.3	0.7	285	260	143	236
New Zealand	1.6	1.1	4.3	*4.0*	11	10	0.6	0.5	4	*13*	61	17
Nicaragua	2.4	1.4	7.6	*2.6*	15	12	1.0	0.6	87	..	..	..
Niger	*1.2*	*1.1*	..	..	5	6	0.1	0.1	..	..	*11*	*3*
Nigeria	0.5	*1.1*	..	..	76	77	0.2	0.2	..	..	56	2
Norway	3.0	*1.8*	7.0	*5.9*	36	33	1.7	1.4	5	203	317	82
Oman	16.2	13.0	40.9	*40.7*	35	38	6.7	6.1	*1*	..	20	48
Pakistan	6.1	4.5	27.7	21.6	580	590	1.4	1.2	*1*	8	..	..
Panama	1.2	*1.2*	4.8	*4.2*	11	13	1.1	1.1	..	..	2	*12*
Papua New Guinea	1.3	*0.8*	4.2	*3.3*	4	4	0.2	0.2	..	..	10	*12*
Paraguay	1.6	0.9	11.8	*5.0*	16	17	1.0	0.9	..	..	1	*6*
Peru	..	1.3	..	*9.2*	112	115	1.4	1.2	..	5	132	4
Philippines	1.3	1.0	6.5	*5.1*	107	107	0.4	0.3	..	..	59	17
Poland	2.3	1.8	*5.5*	*5.3*	270	187	1.4	0.9	49	43	20	258
Portugal	2.7	2.3	6.2	*5.4*	80	71	1.6	1.4	*1*	..	6	103
Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..

5.8 Defense expenditures and arms transfers

	Military expenditures				Armed forces personnel				Arms transfers			
	% of GDP		% of central government expenditure		Total thousands		% of labor force		$ millions 1990 prices Exports		Imports	
	1992	2002	1992	2002	1992	1999	1992	1999	1992	2002	1992	2002
Romania	4.3	2.3	10.7	*8.1*	172	170	1.6	1.6	12	*3*	160	186
Russian Federation	5.5	4.0	*21.1*	*15.4*	1,900	900	2.5	1.2	2,384	5,941	86	170
Rwanda	4.4	3.6	21.6	..	30	40	0.8	1.0	..	..	2	*14*
Saudi Arabia	11.7	11.3	..	..	172	190	3.1	2.9	*13*	..	1,198	478
Senegal	1.8	1.5	..	*6.8*	18	13	0.5	0.3	..	..	*1*	..
Serbia and Montenegro	..	*4.9*	..	..	137	105	2.8	2.1	24	*7*	0	*0*
Sierra Leone	2.5	2.2	17.7	..	8	3	0.5	0.2	..	..	1	*13*
Singapore	4.8	5.2	24.0	*22.8*	56	60	3.4	3.0	8	2	100	227
Slovak Republic	*2.1*	*1.9*	..	*4.9*	*33*	36	*1.2*	1.2	*157*	40	*181*	27
Slovenia	2.2	1.5	5.8	*3.5*	15	10	1.5	1.0	..	..	*30*	0
Somalia	..	..	..	..	..	..	..	..	..	..	..	..
South Africa	2.9	*1.6*	8.8	*5.4*	75	68	0.5	0.4	83	34	140	*17*
Spain	1.6	1.2	4.4	*4.2*	198	155	1.2	0.9	88	65	187	132
Sri Lanka	3.0	*3.9*	11.3	*14.7*	110	110	1.6	1.4	..	..	21	9
Sudan	2.5	*3.0*	..	*27.4*	82	105	0.8	0.9	..	..	5	*134*
Swaziland	1.9	*1.5*	..	*5.2*	3	3	1.1	0.8	..	..	..	*1*
Sweden	2.6	1.9	5.6	*5.4*	70	52	1.5	1.1	182	120	47	45
Switzerland	1.8	1.1	7.0	*4.2*	31	39	0.8	1.0	283	11	170	36
Syrian Arab Republic	9.0	6.1	39.0	*24.2*	408	310	11.0	6.2	38	*0*	317	162
Tajikistan	0.4	*1.2*	..	*10.1*	3	7	0.1	0.3	..	..	*24*	..
Tanzania	1.9	*1.3*	..	..	46	35	0.3	0.2	..	..	20	..
Thailand	2.3	1.4	15.3	*7.1*	283	300	0.9	0.8	..	..	395	150
Togo	2.9	..	..	..	8	11	0.5	0.6	..	..	*3*	*7*
Trinidad and Tobago	..	..	..	..	2	2	0.4	0.4	..	..	..	*1*
Tunisia	1.9	*1.6*	5.8	*5.2*	35	35	1.1	0.9	..	..	32	7
Turkey	3.7	5.0	18.8	*10.0*	704	789	2.7	2.5	..	29	1,347	721
Turkmenistan	*1.8*	*3.8*	..	..	28	15	1.8	0.8	..	..	..	..
Uganda	1.6	2.4	..	*10.1*	70	50	0.7	0.5	..	..	..	*6*
Ukraine	*0.5*	2.8	..	*9.8*	430	340	1.6	1.3	232	270	..	..
United Arab Emirates	4.5	*2.5*	37.4	*30.1*	55	65	5.2	4.9	..	*28*	204	452
United Kingdom	3.8	2.4	8.7	*7.0*	293	218	1.0	0.7	693	719	1,166	575
United States	4.8	3.4	21.1	*16.0*	1,920	1,490	1.5	1.0	12,108	3,941	198	346
Uruguay	2.1	*1.3*	8.0	*4.2*	25	24	1.8	1.6	..	*1*	37	2
Uzbekistan	*1.5*	*1.1*	..	..	40	60	0.5	0.6	..	170	..	5
Venezuela, RB	1.6	1.2	8.2	*6.1*	75	75	1.0	0.8	..	..	48	50
Vietnam	3.4	..	*10.6*	..	857	485	2.4	1.2	..	..	..	69
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	9.1	4.5	30.7	*18.8*	64	69	1.5	1.3	..	..	..	496
Zambia	3.0	*0.6*	..	..	16	17	0.5	0.4	..	..	..	*27*
Zimbabwe	3.7	3.2	11.3	*9.4*	48	40	1.0	0.7	..	..	57	*8*
World	**3.0 w**	**2.4 w**	**11.3 w**	***11.0* w**	**24,533 t**	**21,198 t**	**0.9 w**	**0.7 w**				
Low income	2.4	2.7	14.5	*13.0*	6,040	5,869	0.7	0.6				
Middle income	3.1	2.6	13.4	*11.9*	12,071	9,931	1.0	0.7				
Lower middle income	3.1	2.7	15.1	*14.7*	10,676	8,495	1.0	0.7				
Upper middle income	3.0	2.6	8.5	*6.1*	1,395	1,436	1.3	1.1				
Low & middle income	3.0	2.6	13.6	*12.3*	18,111	15,800	0.9	0.7				
East Asia & Pacific	2.4	2.3	23.7	*16.4*	6,506	5,166	0.7	0.5				
Europe & Central Asia	4.5	3.2	*15.8*	*9.6*	4,303	3,192	2.1	1.3				
Latin America & Carib.	1.2	1.2	5.3	*6.9*	1,443	1,371	0.8	0.6				
Middle East & N. Africa	7.9	*6.9*	..	..	2,624	2,520	3.3	2.6				
South Asia	2.7	2.7	16.8	*14.7*	2,152	2,153	0.4	0.4				
Sub-Saharan Africa	2.5	*1.8*	*8.4*	..	1,083	1,398	0.5	0.5				
High income	3.0	2.4	11.1	*11.0*	6,422	5,398	1.4	1.1				
Europe EMU	2.3	1.8	5.7	*4.9*	2,181	1,768	1.6	1.3				

Note: Data for some countries are based on partial or uncertain data or rough estimates; see SIPRI (2003) and U.S. Department of State (2002).

Defense expenditures and arms transfers 5.8

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 military expenditures as a share of gross domestic product (GDP) are a rough indicator of the portion of national resources used for military activities and of the burden on the national economy. As an "input" measure, military spending is not directly related to the "output" of military activities, capabilities, or military security. Data on defense spending from governments are often incomplete and unreliable. Even in countries where the parliament vigilantly reviews government budgets and spending, defense spending and arms transfers 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).

This and the previous edition of *World Development Indicators* use data on military expenditures and arms transfers from the Stockholm International Peace Research Institute (SIPRI). The data on military expenditures as a percentage of GDP are from SIPRI, and military expenditures as a percentage of central government expenditure are calculated from SIPRI data on military expenditures and IMF data on central government expenditures.

SIPRI's primary source of military expenditure data is official data provided by national governments. These data are derived from national budget documents, defense white papers, and other public documents from official government agencies, including governments' responses to questionnaires sent by SIPRI, the United Nations, or the Organization for Security and Co-operation in Europe. Secondary sources include international statistics, such as those of the North Atlantic Treaty Organization (NATO) and the International Monetary Fund's (IMF) *Government Finance Statistics Yearbook*. Other secondary sources include country reports of the Economist Intelligence Unit, country reports by IMF staff, and specialist journals and newspapers. Data on military expenditures presented in the table may therefore differ from national source data.

Lack of sufficiently detailed data makes it difficult to apply a common definition of military expenditure globally, so SIPRI has adopted a definition (derived from the NATO definition) as a guideline (see *Definitions*). This definition cannot be applied for all countries, however, since that would require much more detailed information than is available about what is included in military budgets and off-budget military expenditure items. In the many cases where SIPRI cannot make independent estimates, it uses the national data provided. Because of the differences in definitions and the difficulty in verifying the accuracy and completeness of data, the data on military spending are not strictly comparable across countries.

The data on armed forces are from the U.S. Department of State's Bureau of Verification and Compliance, which attributes its data to unspecified U.S. government sources. These data 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 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 data on arms transfers are from SIPRI's Arms Transfers Project, which reports on international flows of conventional weapons. Data are collected from open sources, and since publicly available information is inadequate for tracking all weapons and other military equipment, SIPRI covers only what it terms *major conventional weapons*.

SIPRI's data on arms transfers cover sales of weapons, manufacturing licenses, and aid and gifts; therefore the term *arms transfers* rather than *arms trade* is used. The transferred weapons must be transferred voluntarily by the supplier, must have a military purpose, and must be destined for the armed forces, paramilitary forces, or intelligence agencies of another country. SIPRI data also cover weapons supplied to or from rebel forces in an armed conflict as well as arms deliveries for which neither the supplier nor the recipient can be identified with an acceptable degree of certainty; these data are available in SIPRI's database.

SIPRI's estimates of arms transfers, presented in 1990 constant price US dollars, are designed as a *trend-measuring device* in which similar weapons have similar values, reflecting both the value and quality of weapons transferred. The trends presented in the tables are based on actual deliveries only. SIPRI cautions that these estimated values do not reflect financial value (payments for weapons transferred) for three reasons: reliable data on the value of the transfer are not available; even when the value of a transfer is known, it usually includes more than the actual conventional weapons such as spares, support systems, and training; and even when the value of the transfer is known, details of the financial arrangements such as credit and loan conditions and discounts are usually not known.

Given these measurement issues, SIPRI's method of estimating the transfer of military resources includes an evaluation of the technical parameters of the weapons. Weapons for which a price is not known are compared with the same weapons for which actual acquisition prices are available ("core weapons") or for the closet match. These weapons are assigned a value in an index that reflects the military resource value of the weapons in relation to the "core weapons." These matches are based on such characteristics as size, performance, and type of electronics, and adjustments are made for second-hand weapons. More information on SIPRI's estimation methods and sources of arms transfers is available at http://projects.sipri.se/armstrade/atmethods.html.

Definitions

• **Military expenditures** data from SIPRI are derived from the NATO definition, which includes all current and capital expenditures on the armed forces, including peacekeeping forces; defense ministries and other government agencies engaged in defense projects; paramilitary forces, if these are judged to be trained and equipped for military operations; and military space activities. Such expenditures include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; military research and development; and military aid (in the military expenditures of the donor country). Excluded are civil defense and current expenditures for previous military activities, such as for veterans' benefits, demobilization, conversion, and destruction of weapons. This definition cannot be applied for all countries, however, since that would require much more detailed information than is available about what is included in military budgets and off-budget military expenditure items. (For example, military budgets might or might not 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.) • **Armed forces personnel** are active duty military personnel, including paramilitary forces if these forces resemble regular units in their organization, equipment, training, or mission. • **Arms transfers** cover the supply of military weapons through sales, aid, gifts, and those made through manufacturing licenses. Data cover major conventional weapons such as aircraft, armored vehicles, artillery, radar systems, missiles, and ships designed for military use. Excluded are transfers of other military equipment such as small arms and light weapons, trucks, small artillery, ammunition, support equipment, technology transfers, and other services. See *About the data* for more detail.

Data sources

The data on military expenditures and arms transfers are from SIPRI's *Yearbook 2003: Armaments, Disarmament and International Security.* The data on armed forces personnel are from the Bureau of Verification and Compliance's *World Military Expenditures and Arms Transfers 2000* (U.S. Department of State 2002).

5.9 Transport infrastructure

	Roads			Railways					Ports	Air		
	Total road network km 1995–2001 [a]	Paved roads % 1995–2001 [a]	Goods hauled million ton-km 1995–2001 [a]	Rail lines Total km 1996–2001 [a]	Rail lines Electric km 1996–2001 [a]	Traffic density traffic units per km 1996–2001 [a]	Employee productivity traffic units per employee 1996–2001 [a]	Ratio of passenger tariffs to freight tariffs 1996–2001 [a]	Container traffic TEU thousands 2001	Aircraft departures thousands 2002	Passengers carried thousands 2002	Air freight millions ton-km 2002
Afghanistan	21,000	13.3	..	..	..	..	..	..	..	*3*	*150*	*8*
Albania	18,000	39.0	1,830	440	..	334	39	..	..	4	138	..
Algeria	104,000	68.9	..	3,793	283	419	230	..	338.2	48	3,027	18
Angola	51,429	10.4	..	..	..	..	..	..	..	4	190	51
Argentina	215,471	29.4	..	28,291	179	318	1,209	1.28	500.2	94	5,257	76
Armenia	15,918	96.3	39	842	784	465	80	0.30	..	3	408	5
Australia	811,603	38.7	..	..	..	..	..	..	4,272.0	356	32,483	1,497
Austria	200,000	100.0	16,100	5,780	3,493	4,261	482	1.14	..	136	7,070	396
Azerbaijan	25,013	92.3	4,836	..	..	..	..	..	..	8	575	76
Bangladesh	207,486	9.5	..	2,768	..	1,704	126	0.24	*486.3*	7	1,544	172
Belarus	75,302	89.0	8,982	5,512	874	7,857	630	..	..	6	205	1
Belgium	149,028	78.3	17,487	3,471	2,705	4,445	373	1.07	5,757.6	134	2,342	655
Benin	6,787	20.0	..	..	..	..	..	..	..	*1*	*46*	*7*
Bolivia	53,790	6.5	..	3,163	..	336	1,381	0.31	..	21	1,509	15
Bosnia and Herzegovina	21,846	52.3	..	..	..	..	..	..	..	4	66	1
Botswana	10,217	55.0	..	..	..	..	..	..	..	7	175	0
Brazil	1,724,929	5.5	..	25,652	1,220	1,805	3,970	..	2,923.1	628	35,890	1,540
Bulgaria	37,286	94.0	168	4,290	2,708	1,846	216	0.89	..	2	63	*2*
Burkina Faso	12,506	16.0	..	..	..	..	..	..	..	1	53	*7*
Burundi	14,480	7.1	..	..	..	..	..	..	..	..	..	..
Cambodia	12,323	16.2	412	601	..	228	69	0.39	..	5	125	4
Cameroon	34,300	12.5	..	1,006	..	1,333	496	0.34	..	5	243	43
Canada	901,903	35.3	84,752	39,400	..	7,479	7,600	6.63	3,299.7	264	23,323	1,578
Central African Republic	23,810	2.7	60	..	..	..	..	..	..	*1*	*46*	*7*
Chad	33,400	0.8	..	..	..	..	..	..	..	*1*	*46*	*7*
Chile	79,605	20.2	..	4,814	850	370	2,162	..	1,147.2	78	4,987	1,098
China	1,698,012	91.0	633,040	58,656	14,864	30,262	1,155	1.19	55,717.5 [b]	932	83,672	5,014
Hong Kong, China	1,831	100.0	..	..	..	..	..	..	..	91	15,636	5,715
Colombia	112,988	14.4	31	3,154	..	..	1,795	..	603.1	178	9,395	540
Congo, Dem. Rep.	157,000	..	..	3,641	858	169	40	..	..	5	47	*7*
Congo, Rep.	12,800	9.7	..	900	..	188	55	..	..	*5*	*128*	*7*
Costa Rica	35,881	22.0	3,070	424	109	..	..	..	*563.8*	26	620	13
Côte d'Ivoire	50,400	9.7	..	639	..	986	540	0.67	579.1	*1*	*46*	*7*
Croatia	28,275	84.6	6,783	2,726	983	1,280	163	0.80	..	19	1,127	3
Cuba	60,858	49.0	..	4,667	132	468	81	..	..	10	589	40
Czech Republic	127,728	100.0	40,260	9,365	2,843	2,615	284	..	..	47	2,801	27
Denmark	71,622	100.0	11,696	2,047	625	3,648	770	..	457.3	98	6,322	185
Dominican Republic	12,600	49.4	..	..	..	..	..	..	430.6	..	..	..
Ecuador	43,197	18.9	4,405	..	..	..	..	..	462.5	15	1,292	6
Egypt, Arab Rep.	64,000	78.1	31,500	5,024	59	14,308	753	0.20	1,223.1	42	4,478	248
El Salvador	10,029	19.8	..	1,202	503	..	367	..	..	19	1,804	12
Eritrea	4,010	21.8	..	..	..	..	..	..	..	..	..	..
Estonia	52,038	19.7	4,677	968	132	7,999	1,358	2.36	..	7	254	1
Ethiopia	31,663	12.0	..	781	..	..	..	..	..	28	1,103	84
Finland	77,900	64.5	26,500	5,854	2,372	2,308	1,056	2.47	1,091.8	109	6,414	213
France	894,000	100.0	245,400	32,515	14,104	3,854	715	1.54	3,278.0	733	49,096	4,997
Gabon	8,464	9.9	..	814	..	2,087	894	..	..	8	366	49
Gambia, The	2,700	35.4	..	..	..	..	..	..	..	..	..	..
Georgia	20,229	93.5	520	1,562	1,544	2,794	276	0.37	..	2	112	2
Germany	230,735	99.1	226,982	36,652	19,079	4,128	681	2.77	9,122.3	782	61,043	7,196
Ghana	46,179	18.4	..	953	..	1,778	376	..	..	4	256	19
Greece	117,000	91.8	13,909	2,299	..	830	182	..	1,660.5	113	7,579	81
Guatemala	14,118	34.5	..	..	..	..	..	..	360.2	..	..	..
Guinea	30,500	16.5	..	..	..	..	..	..	..	..	..	..
Guinea-Bissau	4,400	10.3	..	..	..	..	..	..	..	..	..	..
Haiti	4,160	24.3	..	..	..	..	..	..	..	..	..	..

5.9 Transport infrastructure

	Roads			Railways					Ports	Air		
	Total road network km 1995–2001 [a]	Paved roads % 1995–2001 [a]	Goods hauled million ton-km 1995–2001 [a]	Rail lines Total km 1996–2001 [a]	Rail lines Electric km 1996–2001 [a]	Traffic density traffic units per km 1996–2001 [a]	Employee productivity traffic units per employee 1996–2001 [a]	Ratio of passenger tariffs to freight tariffs 1996–2001 [a]	Container traffic TEU thousands 2001	Aircraft departures thousands 2002	Passengers carried thousands 2002	Air freight millions ton-km 2002
Honduras	13,603	20.4	..	..	..	..	..	..	*406.4*	..	..	..
Hungary	167,839	43.7	11,398	7,729	2,628	2,242	319	..	..	33	2,134	27
India	3,319,644	45.7	958	62,759	14,261	11,725	467	0.31	3,243.0	242	18,225	550
Indonesia	342,700	46.3	..	5,324	131	3,974	610	0.95	4,539.9	152	12,114	406
Iran, Islamic Rep.	167,157	56.3	..	6,688	148	3,185	758	..	..	90	10,085	82
Iraq	45,550	84.3	..	..	..	..	..	..	..	..	..	..
Ireland	92,500	94.1	5,900	1,915	37	982	171	..	775.3	177	19,729	116
Israel	16,521	100.0	..	925	..	2,112	1,628	..	1,461.0	39	3,731	1,058
Italy	479,688	100.0	219,800	16,499	10,937	4,102	618	1.42	7,918.3	351	28,245	1,394
Jamaica	18,700	70.1	..	..	..	..	..	..	1,065.0	23	2,016	57
Japan	1,166,340	76.6	313,118	20,165	12,080	13,048	1,528	..	13,501.4	648	109,247	8,102
Jordan	7,245	100.0	..	293	..	2,123	518	..	..	16	1,300	197
Kazakhstan	82,638	93.9	5,497	13,545	3,725	9,981	1,069	..	..	13	593	15
Kenya	63,942	12.1	..	2,634	..	699	184	..	..	26	1,600	118
Korea, Dem. Rep.	31,200	6.4	..	..	..	..	..	..	..	1	84	2
Korea, Rep.	86,990	74.5	74,504	3,123	668	12,456	1,323	1.43	11,542.7	243	34,512	7,913
Kuwait	4,450	80.6	..	..	..	..	..	..	..	19	2,299	254
Kyrgyz Republic	18,500	91.1	1,220	..	..	..	..	..	..	4	177	6
Lao PDR	21,716	44.5	..	..	..	..	..	..	..	7	220	2
Latvia	69,732	38.6	5,359	2,331	258	5,834	917	..	..	9	265	1
Lebanon	7,300	84.9	..	..	..	..	..	..	298.9	11	874	81
Lesotho	5,940	18.3	..	..	..	..	..	..	..	..	..	..
Liberia	10,600	6.2	..	..	..	..	..	..	..	..	..	..
Libya	83,200	57.2	..	..	..	..	..	..	..	6	559	0
Lithuania	76,573	91.3	8,274	1,905	122	4,171	611	..	..	10	304	2
Macedonia, FYR	8,684	62.0	2,693	699	233	972	162	0.39	..	2	166	0
Madagascar	49,827	11.6	..	..	..	..	..	..	..	19	549	29
Malawi	28,400	18.5	..	710	..	159	176	0.25	..	5	105	1
Malaysia	65,877	75.8	..	1,622	152	1,368	370	0.87	7,541.7	186	16,208	1,924
Mali	15,100	12.1	..	734	..	658	322	..	..	*1*	*46*	*7*
Mauritania	7,660	11.3	..	..	..	..	..	..	..	2	106	0
Mauritius	2,000	98.0	..	..	..	..	..	..	..	14	1,025	189
Mexico	329,532	32.8	197,958	17,697	250	2,660	3,925	..	1,561.9	271	19,282	311
Moldova	12,691	86.1	964	..	..	..	..	..	..	4	129	0
Mongolia	49,250	3.5	129	1,810	..	2,963	394	..	..	6	270	8
Morocco	57,698	56.0	2,952	1,907	1,003	3,425	610	0.86	375.8	38	3,146	51
Mozambique	30,400	18.7	110	..	..	..	..	..	..	8	282	7
Myanmar	28,200	12.2	..	..	..	..	..	..	..	21	1,186	2
Namibia	62,237	12.9	..	2,382	..	474	..	..	..	5	222	21
Nepal	13,223	30.8	..	..	..	..	..	..	..	13	681	18
Netherlands	116,500	90.0	32,700	2,802	2,061	6,631	752	2.56	6,741.7	250	22,931	4,204
New Zealand	92,207	63.1	..	3,913	519	938	1,120	1.46	1,413.6	265	12,240	688
Nicaragua	19,032	11.0	..	..	..	..	..	..	..	*1*	*61*	*1*
Niger	10,100	7.9	..	..	..	..	..	..	..	*1*	*46*	*7*
Nigeria	194,394	30.9	..	3,557	..	287	65	0.10	..	11	512	9
Norway	91,443	77.0	12,796	..	..	..	..	..	..	271	13,706	185
Oman	32,800	30.0	..	..	..	..	..	..	1,415.5	23	2,104	130
Pakistan	257,683	59.0	111,323	7,791	293	2,838	232	0.28	965.6	42	4,141	347
Panama	11,643	34.6	..	..	..	..	..	..	1,248.4	22	1,048	22
Papua New Guinea	19,600	3.5	..	..	..	..	..	..	..	31	1,235	24
Paraguay	29,500	50.8	..	..	..	..	..	..	..	9	269	..
Peru	72,900	12.8	..	1,691	..	406	363	..	*537.6*	31	1,879	102
Philippines	201,994	21.0	..	491	..	505	112	0.09	3,270.8	43	5,660	267
Poland	364,697	68.3	74,403	22,560	11,826	3,537	415	0.79	287.4	70	2,846	67
Portugal	68,732	86.0	14,200	2,814	904	2,066	465	..	970.1	114	6,894	198
Puerto Rico	24,023	94.0	..	..	..	..	..	..	1,426.2	..	..	..

5.9 Transport infrastructure

	Roads			Railways					Ports	Air		
	Total road network km 1995–2001 [a]	Paved roads % 1995–2001 [a]	Goods hauled million ton-km 1995–2001 [a]	Rail lines Total km 1996–2001 [a]	Rail lines Electric km 1996–2001 [a]	Traffic density traffic units per km 1996–2001 [a]	Employee productivity traffic units per employee 1996–2001 [a]	Ratio of passenger tariffs to freight tariffs 1996–2001 [a]	Container traffic TEU thousands 2001	Aircraft departures thousands 2002	Passengers carried thousands 2002	Air freight millions ton-km 2002
Romania	198,603	49.5	14,288	11,364	3,929	2,467	267	1.24	..	18	961	9
Russian Federation	537,289	67.4	139	86,075	40,962	15,854	1,054	0.97	795.7	345	20,892	1,039
Rwanda	12,000	8.3	..	..	..	..	..	..	..	..	..	..
Saudi Arabia	152,044	29.9	..	1,390	..	799	555	..	1,930.1	109	13,564	862
Senegal	14,576	29.3	..	906	..	562	339	..	..	3	245	*7*
Serbia and Montenegro	44,993	62.3	630	4,058	1,103	522	94	..	..	20	1,186	4
Sierra Leone	11,330	7.9	..	..	..	..	..	..	..	0	14	6
Singapore	3,066	100.0	..	..	..	..	..	..	16,986.0	72	17,257	6,772
Slovak Republic	42,956	87.3	20,233	3,662	1,536	3,851	302	1.11	..	2	39	1
Slovenia	20,236	100.0	5,695	..	..	2,746	..	..	..	15	721	5
Somalia	22,100	11.8	..	..	..	..	..	..	..	..	..	..
South Africa	362,099	20.3	..	22,657	10,430	5,018	2,933	..	1,801.6	122	8,167	783
Spain	663,795	99.0	98,145	13,866	7,523	2,295	842	..	6,669.2	500	40,585	807
Sri Lanka	11,547	95.0	30	1,447	..	2,271	189	0.11	1,764.7	11	1,741	203
Sudan	11,900	36.3	..	4,599	..	298	98	..	..	8	409	33
Swaziland	3,107	..	..	..	..	..	..	..	..	*2*	*90*	*0*
Sweden	212,961	78.6	32,000	10,068	7,405	2,492	2,144	2.34	914.9	201	12,696	267
Switzerland	71,176	..	23,500	..	..	..	..	..	..	243	13,292	1,028
Syrian Arab Republic	44,575	21.1	..	1,771	..	996	160	..	..	13	824	25
Tajikistan	27,767	82.7	..	..	..	..	..	..	..	6	397	4
Tanzania	88,200	4.2	..	2,722	..	598	181	0.41	..	5	138	2
Thailand	57,403	98.5	..	4,044	..	3,342	660	0.75	3,800.9	98	18,112	1,824
Togo	7,520	31.6	..	..	..	..	..	..	..	*1*	*46*	*7*
Trinidad and Tobago	8,320	51.1	..	..	..	..	..	..	385.2	23	1,269	36
Tunisia	18,997	65.4	..	2,260	60	1,010	341	1.87	..	19	1,789	19
Turkey	354,373	35.5	151,421	8,671	1,752	1,798	330	1.20	1,777.1	106	10,640	381
Turkmenistan	24,000	81.2	..	..	..	..	..	..	..	25	1,464	14
Uganda	27,000	6.7	..	261	..	805	131	..	..	0	41	21
Ukraine	169,630	96.7	16,811	22,302	9,170	9,535	598	..	..	34	1,512	12
United Arab Emirates	1,088	100.0	..	..	..	..	..	..	5,872.2	55	9,667	2,079
United Kingdom	371,913	100.0	150,700	17,067	5,225	3,500	2,678	..	7,059.6	906	71,892	4,941
United States	6,304,193	58.8	1,534,430	160,000	484	13,800	13,476	9.28	29,676.9	7,878 [c]	593,246 [c]	29,070 [c]
Uruguay	8,983	90.0	..	3,003	..	127	191	..	293.0	8	525	12
Uzbekistan	81,600	87.3	..	..	619	4,830	304	..	..	23	1,451	69
Venezuela, RB	96,155	33.6	..	336	..	161	180	0.21	1,078.0	167	6,370	33
Vietnam	93,300	25.1	..	3,142	..	1,624	154	0.88	*1,290.6*	43	4,082	151
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	67,000	11.5	..	..	..	..	..	..	388.4	16	869	37
Zambia	91,440	22.0	..	1,273	..	144	610	0.27	..	5	47	*1*
Zimbabwe	18,338	47.4	..	2,759	311	1,977	454	0.60	..	5	251	26
World		**44.0 m**		**.. s**	**.. s**	**.. m**	**.. m**	**.. m**	**259,736 s**	**20,481 s**	**1,615,074 s**	**116,626 s**
Low income		16.0		..	..	..	..	..	..	791	53,966	2,330
Middle income		52.3		..	..	..	610	..	94,397	4,365	321,221	17,661
Lower middle income		52.7		..	..	..	610	..	76,710	3,094	236,701	12,669
Upper middle income		51.1		..	..	..	583	..	17,687	1,272	84,520	4,993
Low & middle income		30.9		..	..	..	..	..	104,113	5,156	375,186	19,992
East Asia & Pacific		25.1		..	..	2,293	382	..	74,871	1,626	144,068	9,726
Europe & Central Asia		89.0		..	..	..	304	..	..	825	50,903	1,767
Latin America & Carib.		26.9		..	..	..	..	..	12,058	1,626	94,234	3,938
Middle East & N. Africa		63.8		..	..	..	555	..	..	429	42,619	1,750
South Asia		36.9		..	..	..	..	0.24	5,973	319	26,431	1,290
Sub-Saharan Africa		12.9		..	..	..	..	..	..	331	16,931	1,520
High income		92.9		..	..	3,648	770	..	155,622	15,325	1,239,888	96,634
Europe EMU		92.9		124,467	63,215	3,854	618	..	43,985	3,440	252,823	24,415

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

Transport infrastructure 5.9

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 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, extent, and productivity of roads, railways, and air transport systems and of the volume of traffic in these modes as well as in ports.

Data for transport sectors are not always internationally comparable. Unlike for demographic statistics, national income accounts, and international trade data, the collection of infrastructure data has not been "internationalized." But 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 (for example, in some countries a path used mainly by animals may be considered a road, while in others a road must be registered with a state agency responsible for its maintenance), inappropriate geographic units, lack of timeliness, and variations in the nature of the terrain.

Moreover, the quality of transport service (reliability, transit time, and condition of goods delivered) is rarely measured, though it may be as important as quantity in assessing an economy's transport system. A new initiative is under way in the World Bank to improve data availability and consistency. Information covering access, affordability, efficiency, quality, and fiscal and institutional aspects of the transport sector will help to measure progress and improve performance.

The railways indicators focus on efficiency and productivity. Traffic density is an indication of the intensity of use of a railway's largest investment—its track. Traffic densities for branch lines tend to range around 500,000 traffic units per kilometer (see *Definitions*), while those for mainlines range from more than 5 million traffic units per kilometer to 100 million. (Note that kilometers of track may exceed kilometers of line because of double and triple tracking, yard tracks, and the like.) Railways whose traffic density averages less than 500,000 traffic units per kilometer need to operate at low costs and very high labor productivity to survive. Labor is the most expensive factor of production for a railway, and most railways have found that improving labor productivity is the most important factor in establishing economic viability. Employee productivity is heavily influenced by the balance of passenger and freight service, with productivity far lower in passenger service. In developing countries a ratio of passenger tariffs to freight tariffs greater than 1 indicates an absence of significant cross-subsidies and a potential to provide higher quality service. This ratio, like the other railway indicators, has no normative value and is intended for relative analysis only.

Measures of port container traffic, much of it commodities of medium to high value added, give some indication of economic growth in a country. But when traffic is merely transshipment, much of the economic benefit goes to the terminal operator and ancillary services for ships and containers rather than to the country more broadly. In transshipment centers empty containers may account for as much as 40 percent of traffic.

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.

Definitions

• **Total road network** covers motorways, highways, main or national roads, secondary or regional roads, and all other roads in a country. • **Paved roads** are roads surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones. • **Goods hauled by road** are the volume of goods transported by road vehicles, measured in millions of metric tons times kilometers traveled. • **Total rail lines** refer to the track length of the railway lines. • **Electric rail lines** refer to the length of line with electric traction. This line can include overhead catenary at various direct current or alternating current voltages and third-rail direct current systems. • **Railway traffic density** is total traffic units divided by total rail lines; total traffic units are the sum of passenger-kilometers (passengers times kilometers traveled) and freight ton-kilometers (metric tons of freight times kilometers traveled) divided by kilometers of line. • **Railway employee productivity** is annual output (in traffic units) per employee. • **Ratio of railway passenger tariffs to freight tariffs** is the average passenger fare (total passenger revenue divided by total passenger-kilometers) divided by the average freight rate (total freight revenue divided by total ton-kilometers). A ratio of very much less than 1 indicates a likelihood of passengers being cross-subsidized by freight tariffs. • **Port container traffic** measures the flow of containers from land to sea transport modes and vice versa in twenty-foot-equivalent units (TEUs), a standard-size container. Data refer to coastal shipping as well as international journeys. Transshipment traffic is counted as two lifts at the intermediate port (once to off-load and again as an outbound lift) and includes empty units. • **Aircraft departures** are domestic and international takeoffs of air carriers registered in the country. • **Air passengers carried** include both domestic and international 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 IRF's *World Road Statistics*. The data on railways are from a database maintained by the World Bank's Transport and Urban Development Department, Transport Division. The data on port container traffic are from Containerisation International's *Containerisation International Yearbook*. And the data on air transport are from the ICAO's *Civil Aviation Statistics of the World* and ICAO staff estimates.

5.10 Power and communications

	Electric power		Telephone mainlines [a]							Mobile phones [a]	International telecommunications [a]	
	Consumption per capita kwh 2001	Transmission and distribution losses % of output 2001	per 1,000 people 2002	In largest city per 1,000 people 2002	Waiting list thousands 2002	Faults per 100 mainlines 2002	per employee 2002	Revenue per line $ 2002	Cost of local call $ per 3 minutes 2002	per 1,000 people 2002	Outgoing traffic minutes per subscriber 2002	Cost of call to U.S. $ per 3 minutes 2002
Afghanistan	..	..	1	*8*	..	..	..	..	..	1	..	..
Albania	1,123	51	71	*94*	98.5	57.2	65	1,139	0.02	276	282	2.47
Algeria	638	16	61	*124*	*727.0*	*6.0*	*105*	*192*	*0.02*	13	*111*	..
Angola	100	15	6	*21*	240.3	..	38	*1,633*	0.09	9	404	*3.11*
Argentina	2,107	14	219	..	*93.1*	..	*337*	*931*	0.03	178	53	..
Armenia	1,127	26	143	*212*	64.1	60.0	92	151	0.02	19	67	..
Australia	9,292	7	539	..	0.0	8.0	*136*	*1,276*	0.12	640	*215*	0.68
Austria	7,031	5	489	..	0.0	5.7	*228*	1,315	0.19	786	312	..
Azerbaijan	1,846	13	113	*270*	*55.4*	*48.0*	113	93	0.10	107	35	5.52
Bangladesh	94	18	5	*30*	*199.1*	..	*29*	*593*	*0.03*	8	*77*	*2.47*
Belarus	2,676	14	299	*397*	341.5	26.8	112	72	0.01	47	81	2.25
Belgium	7,596	5	494	..	..	5.9	197	1,343	0.14	786	353	..
Benin	66	70	9	..	*23.0*	*6.0*	*48*	*1,044*	0.28	32	*294*	*5.76*
Bolivia	403	12	68	*109*	..	..	*174*	*742*	*0.09*	105	69	..
Bosnia and Herzegovina	1,444	17	237	*502*	..	..	130	*247*	0.03	196	*106*	3.01
Botswana	..	..	87	..	..	..	*83*	*1,238*	0.02	241	425	..
Brazil	1,729	17	223	*311*	*200.0*	*3.0*	*400*	*546*	*0.03*	201	21	..
Bulgaria	3,066	14	368	..	145.8	3.5	104	318	0.02	333	48	1.45
Burkina Faso	..	..	5	*42*	12.4	19.7	51	984	0.10	8	307	2.58
Burundi	..	..	3	..	*4.7*	..	*27*	*737*	0.02	7	127	3.71
Cambodia	..	..	3	*19*	..	..	61	*705*	0.03	28	278	..
Cameroon	170	26	7	..	..	..	50	..	0.06	43	*208*	..
Canada	15,385	8	635	..	0.0	..	237	1,053	..	377	*254*	..
Central African Republic	..	..	2	..	1.2	..	23	1,196	0.43	3	466	*12.93*
Chad	..	..	2	*8*	..	*60.8*	*16*	..	0.11	4	*363*	*9.11*
Chile	2,557	7	230	*333*	*32.3*	*25.0*	179	698	0.10	428	79	*2.18*
China	893	7	167	*584*	..	..	..	238	0.03	161	*7*	..
Hong Kong, China	5,541	12	565	*577*	0.0	..	216	*1,700*	0.00	942	1,039	2.62
Colombia	818	22	179	*327*	*1,174.7*	*45.5*	*229*	499	*0.03*	106	*40*	..
Congo, Dem. Rep.	47	4	0	..	..	..	..	..	..	11	..	..
Congo, Rep.	75	65	7	..	..	..	..	..	..	67	..	..
Costa Rica	1,557	7	251	..	15.8	4.2	213	351	0.03	111	125	*1.93*
Côte d'Ivoire	..	..	20	*68*	24.2	81.0	91	1,186	0.22	62	204	6.38
Croatia	2,683	21	417	..	0.0	12.0	171	679	0.09	535	198	..
Cuba	1,069	15	*51*	*121*	..	*9.6*	*34*	*1,370*	*0.09*	2	*65*	*7.35*
Czech Republic	4,977	7	362	*666*	25.1	8.3	153	890	0.13	849	107	0.83
Denmark	6,160	5	689	..	*0.0*	*8.0*	*173*	*1,091*	*0.08*	833	214	..
Dominican Republic	822	26	110	..	..	..	*55*	..	0.06	207	245	..
Ecuador	631	25	110	*133*	*14.5*	*35.3*	*275*	*336*	0.03	121	*48*	*1.75*
Egypt, Arab Rep.	1,046	12	110	..	206.1	*0.5*	140	335	0.02	67	36	2.57
El Salvador	595	13	103	..	*38.2*	*14.5*	*168*	*903*	*0.07*	138	*243*	*1.23*
Eritrea	..	..	9	*43*	38.5	53.3	56	458	0.03	0	125	3.55
Estonia	3,764	16	351	*422*	4.1	*16.3*	136	881	0.09	650	217	0.74
Ethiopia	22	10	5	*60*	145.9	..	47	295	0.02	1	36	7.05
Finland	14,899	4	523	..	0.0	..	124	1,735	0.13	867	172	1.06
France	6,682	6	569	..	*0.0*	..	232	944	0.12	647	139	..
Gabon	814	18	25	..	..	..	*32*	*2,771*	0.22	215	854	..
Gambia, The	..	..	28	*97*	10.6	..	34	*760*	0.03	73	352	3.46
Georgia	718	12	131	*233*	138.8	17.2	39	208	0.03	102	*108*	0.68
Germany	6,093	4	651	*696*	0.0	..	232	1,084	0.09	727	190	0.35
Ghana	341	15	13	*83*	*154.8*	*67.4*	57	460	0.03	21	213	1.13
Greece	4,205	9	491	*731*	*7.6*	*12.1*	*302*	*864*	0.07	845	158	*0.67*
Guatemala	358	23	71	..	..	..	*236*	*593*	*0.08*	131	172	..
Guinea	..	..	3	..	*1.4*	..	33	*1,119*	0.08	12	*734*	*4.61*
Guinea-Bissau	..	..	9	..	*5.1*	*70.5*	*46*	..	..	0	*271*	..
Haiti	36	53	16	..	..	..	*18*	..	..	17	..	..

5.10 Power and communications

	Electric power		Telephone mainlines [a]							Mobile phones [a]	International telecommunications [a]	
	Consumption per capita kwh 2001	Transmission and distribution losses % of output 2001	per 1,000 people 2002	In largest city per 1,000 people 2002	Waiting list thousands 2002	Faults per 100 mainlines 2002	per employee 2002	Revenue per line $ 2002	Cost of local call $ per 3 minutes 2002	per 1,000 people 2002	Outgoing traffic minutes per subscriber 2002	Cost of call to U.S. $ per 3 minutes 2002
Honduras	508	21	48	..	342.2	3.6	62	1,210	0.06	49	*144*	2.85
Hungary	2,998	13	361	*588*	7.8	..	176	1,015	0.13	676	66	0.79
India	365	27	40	*136*	*1,648.8*	126.0	*92*	*198*	0.02	12	16	*3.20*
Indonesia	404	13	37	*261*	..	*20.0*	*181*	*300*	0.03	55	37	..
Iran, Islamic Rep.	1,570	16	187	*381*	1,480.5	..	258	104	0.01	33	21	*7.70*
Iraq	1,475	..	28	..	..	..	..	..	..	1	..	..
Ireland	5,415	8	502	..	..	7.6	133	1,643	0.14	763	706	..
Israel	5,841	3	467	..	..	..	*249*	1,190	0.02	955	385	..
Italy	4,813	7	481	..	*0.0*	..	*358*	*1,288*	*0.11*	939	*169*	..
Jamaica	2,343	8	170	..	168.6	39.7	*192*	*1,050*	0.07	535	310	..
Japan	7,237	4	558	*554*	*0.0*	..	*490*	*1,609*	0.07	637	37	*1.67*
Jordan	1,252	12	127	*183*	1.4	10.7	108	1,128	0.04	229	294	1.96
Kazakhstan	2,850	17	130	..	*168.3*	..	65	289	0.00	64	63	..
Kenya	117	21	10	*77*	*134.0*	*220.9*	*17*	*1,482*	0.07	42	*75*	*5.84*
Korea, Dem. Rep.	..	..	21	..	..	..	..	..	..	0	..	..
Korea, Rep.	5,288	6	489	*632*	*0.0*	1.5	437	935	0.03	679	45	1.74
Kuwait	10,251	3	204	*46*	*0.0*	..	66	1,778	0.00	519	394	1.50
Kyrgyz Republic	1,351	34	77	*168*	*37.7*	..	*50*	110	0.09	10	46	*8.92*
Lao PDR	..	..	11	*65*	*5.9*	..	45	437	*0.02*	10	*138*	*6.37*
Latvia	1,943	23	301	*500*	14.3	22.7	180	338	0.11	394	65	2.02
Lebanon	1,824	18	199	..	..	..	..	..	*0.07*	227	*149*	..
Lesotho	..	..	13	*64*	21.1	72.8	80	415	0.11	42	64	*2.31*
Liberia	..	..	*2*	..	..	..	..	..	..	*1*	*868*	..
Libya	4,020	..	*118*	..	..	..	*43*	..	..	13	*68*	..
Lithuania	1,851	10	270	*427*	3.9	*17.0*	*217*	472	0.14	475	36	2.31
Macedonia, FYR	..	..	271	..	..	..	*143*	*406*	*0.01*	177	116	..
Madagascar	..	..	4	*9*	1.8	42.5	25	1,614	0.07	10	111	7.41
Malawi	..	..	7	*41*	17.4	..	*17*	*625*	0.06	8	*435*	*0.06*
Malaysia	2,731	6	190	..	65.9	*40.0*	*222*	*948*	0.03	377	*144*	*2.37*
Mali	..	..	5	*24*	..	*177.6*	*37*	*1,159*	*0.07*	5	*300*	*12.28*
Mauritania	..	..	12	..	..	..	*26*	*1,330*	0.13	92	*394*	..
Mauritius	..	..	270	*376*	13.5	*56.8*	181	499	0.04	289	113	2.50
Mexico	1,643	14	147	*156*	..	*1.9*	*139*	1,134	*0.16*	255	134	*3.04*
Moldova	785	47	161	*350*	107.3	4.9	95	136	0.02	77	75	2.21
Mongolia	..	..	53	*99*	37.8	28.4	30	443	0.02	89	37	*4.92*
Morocco	461	7	38	..	*5.0*	*24.8*	*74*	1,465	0.15	209	*226*	1.63
Mozambique	266	3	5	..	12.7	70.0	39	1,533	*0.08*	14	274	..
Myanmar	88	20	7	*32*	93.5	169.0	43	..	0.05	1	27	*0.36*
Namibia	..	..	65	*157*	2.6	42.2	81	700	*0.03*	80	499	*4.28*
Nepal	61	21	14	*315*	317.3	88.1	70	257	0.01	1	102	..
Netherlands	6,199	4	618	..	*0.0*	..	*169*	*1,313*	*0.11*	745	*260*	..
New Zealand	8,792	11	448	..	0.0	*30.7*	*325*	1,127	0.00	622	547	..
Nicaragua	268	30	32	..	..	4.6	82	591	0.08	38	108	3.20
Niger	..	..	2	*24*	..	*104.6*	*16*	*848*	*0.10*	1	*292*	*8.77*
Nigeria	82	38	6	*12*	..	..	58	*715*	..	13	124	..
Norway	24,881	7	734	..	0.0	..	221	*1,549*	0.15	844	165	0.31
Oman	3,078	17	84	..	2.1	..	105	2,238	0.07	171	729	0.79
Pakistan	358	26	25	..	214.0	..	*58*	395	0.02	8	35	*3.60*
Panama	1,340	22	122	*284*	..	*30.8*	*78*	*1,018*	*0.12*	189	*120*	*4.36*
Papua New Guinea	..	..	12	*115*	*0.2*	..	*36*	*1,221*	0.08	3	*402*	*4.32*
Paraguay	833	3	47	*91*	..	*3.4*	*25*	*1,069*	*0.09*	288	104	*0.82*
Peru	692	11	66	..	*33.0*	..	*372*	*690*	0.08	86	82	..
Philippines	489	12	42	*265*	..	..	273	824	0.00	191	52	..
Poland	2,490	10	*295*	..	*501.6*	*17.2*	*159*	*646*	*0.08*	363	*73*	1.79
Portugal	3,932	9	421	..	..	10.2	240	1,485	0.11	825	124	0.93
Puerto Rico	..	..	*346*	..	..	..	*261*	*1,534*	..	*316*	..	..

5.10 Power and communications

	Electric power		Telephone mainlines [a]							Mobile phones [a]	International telecommunications [a]	
	Consumption per capita kwh 2001	Transmission and distribution losses % of output 2001	per 1,000 people 2002	In largest city per 1,000 people 2002	Waiting list thousands 2002	Faults per 100 mainlines 2002	per employee 2002	Revenue per line $ 2002	Cost of local call $ per 3 minutes 2002	per 1,000 people 2002	Outgoing traffic minutes per subscriber 2002	Cost of call to U.S. $ per 3 minutes 2002
Romania	1,620	13	194	..	542.1	23.0	114	410	0.11	236	50	1.82
Russian Federation	4,270	12	242	..	*5,809.6*	..	*75*	*209*	..	120	34	..
Rwanda	..	..	3	..	..	..	*61*	*934*	0.09	14	*245*	..
Saudi Arabia	5,117	8	144	*214*	73.6	26.2	155	1,893	0.04	217	578	2.40
Senegal	130	19	22	*71*	*9.8*	*17.3*	*152*	*852*	*0.10*	55	*294*	*1.81*
Serbia and Montenegro	..	..	233	*424*	*143.0*	..	178	*146*	0.01	257	123	2.08
Sierra Leone	..	..	5	..	..	..	*19*	..	*0.03*	13	*336*	..
Singapore	7,178	4	463	463	0.0	*2.4*	*221*	1,738	0.02	796	1,020	*0.68*
Slovak Republic	4,360	4	268	*665*	*7.0*	*27.0*	*106*	*604*	*0.12*	544	134	*0.79*
Slovenia	5,535	5	506	..	0.5	22.5	227	671	0.07	835	106	0.52
Somalia	..	..	10	..	..	..	..	..	..	3	..	..
South Africa	3,793	8	107	..	*50.0*	48.2	116	1,102	0.09	304	117	*0.58*
Spain	4,933	9	506	..	..	..	*273*	1,447	*0.07*	824	*210*	..
Sri Lanka	285	18	47	*299*	*257.7*	*99.6*	*72*	379	0.03	49	*58*	2.33
Sudan	67	15	21	*80*	*444.0*	..	*150*	*364*	*0.03*	6	*80*	*3.92*
Swaziland	..	..	34	*131*	15.6	*160.0*	*67*	*826*	0.04	61	657	2.42
Sweden	14,916	7	736	..	*0.0*	..	304	1,189	*0.11*	889	*188*	*0.32*
Switzerland	7,474	5	744	..	0.0	..	231	1,771	0.15	789	*481*	..
Syrian Arab Republic	973	..	123	*156*	*2,805.9*	*50.0*	*84*	*238*	*0.01*	23	*90*	*4.81*
Tajikistan	2,151	15	37	*133*	6.1	126.0	48	32	0.01	2	42	6.96
Tanzania	58	25	5	*20*	8.0	24.0	46	*1,471*	0.12	19	73	5.28
Thailand	1,508	9	105	*452*	710.2	*19.8*	222	637	0.07	260	52	1.54
Togo	..	..	10	*35*	27.5	6.2	57	823	0.10	35	349	2.15
Trinidad and Tobago	3,829	8	250	..	..	..	*100*	*958*	*0.04*	278	*218*	*2.22*
Tunisia	987	11	117	..	*108.7*	*29.0*	*143*	*450*	0.02	52	*164*	..
Turkey	1,391	19	281	*388*	142.9	37.4	297	*275*	0.13	347	34	2.09
Turkmenistan	1,231	13	77	..	*36.8*	*86.4*	*52*	*145*	..	2	64	..
Uganda	..	..	2	..	..	..	*23*	..	0.21	16	*125*	3.51
Ukraine	2,217	20	216	..	2,158.7	..	86	*146*	..	84	36	..
United Arab Emirates	10,787	9	314	*348*	0.4	0.3	115	1,994	0.00	696	1,732	1.73
United Kingdom	5,653	8	591	..	0.0	11.0	148	2,087	0.18	841	258	..
United States	11,714	6	646	..	..	*12.4*	170	1,579	0.00	488	217	..
Uruguay	1,918	16	280	*335*	*0.0*	..	*168*	*751*	*0.17*	193	*87*	*4.88*
Uzbekistan	1,634	9	66	*248*	*38.9*	*87.4*	*69*	*118*	*0.01*	7	36	*13.95*
Venezuela, RB	2,605	25	113	..	..	*2.0*	192	1,033	0.04	256	*104*	..
Vietnam	325	14	48	..	..	..	49	356	0.02	23	17	..
West Bank and Gaza	..	..	87	..	0.7	97.0	188	*353*	0.05	93	132	1.03
Yemen, Rep.	109	26	28	*80*	704.8	..	100	266	0.02	21	81	4.10
Zambia	585	3	8	*22*	11.6	90.8	*28*	*808*	0.09	13	178	6.45
Zimbabwe	810	21	25	*76*	*158.9*	..	*63*	*817*	*0.04*	30	*309*	*4.36*
World	**2,159 w**	**9 w**	**176 w**	***296* w**	**.. s**	***26.4* m**	**105 m**	**890 m**	**0.06 m**	**110 m**	**155 m**	**2.09 m**
Low income	317	23	28	*130*	*4,517.4*	*62.5*	49	437	0.07	13	108	3.63
Middle income	1,447	11	167	*406*	..	*28.3*	133	700	0.05	149	124	2.08
Lower middle income	1,304	11	164	*524*	..	*35.3*	110	637	0.04	99	110	2.09
Upper middle income	2,505	12	190	..	..	*17.2*	173	885	0.09	241	166	*2.20*
Low & middle income	938	13	100	*270*	..	*40.0*	80	545	0.06	62	117	2.40
East Asia & Pacific	816	8	131	*502*	..	..	45	440	0.03	24	44	*4.62*
Europe & Central Asia	2,774	13	228	..	*10,859.2*	22.8	113	318	0.06	196	65	2.08
Latin America & Carib.	1,493	16	168	..	..	*9.6*	*161*	709	0.06	126	172	*2.22*
Middle East & N. Africa	1,409	12	107	..	*6,099.3*	*10.1*	140	1,128	0.04	52	213	2.18
South Asia	331	27	34	*127*	*2,623.8*	88.1	55	387	0.02	8	68	2.33
Sub-Saharan Africa	456	11	15	..	..	*56.8*	56	984	0.09	16	208	3.55
High income	8,421	6	585	..	..	*8.3*	197	1,343	0.07	698	285	*0.93*
Europe EMU	5,904	6	555	..	*14.1*	6.8	215	1,395	0.13	805	181	*0.77*

a. Data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2003.* Please cite the ITU for third-party use of these data.

About the data

The quality of an economy's infrastructure, including power and communications, is an important element in investment decisions for both domestic and foreign investors. Government effort alone will not suffice to meet the need for investments in modern infrastructure; public-private partnerships, especially those involving local providers and financiers, will be critical in lowering costs and delivering value for money. In telecommunications, competition in the marketplace, along with sound regulation, is lowering costs and improving the quality of and access to 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.

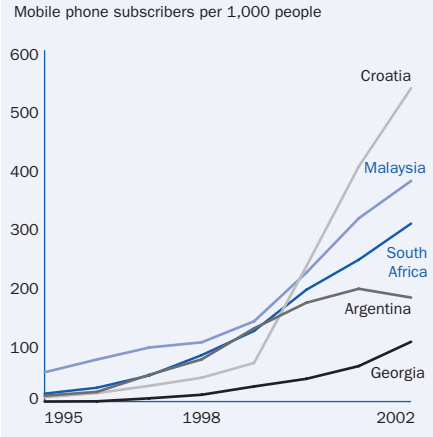
Over the past decade new financing and technology, along with privatization and liberalization, have spurred dramatic growth in telecommunications in many countries. The table presents some common performance indicators for telecommunications, including measures of supply and demand, service quality, 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 countries the waiting list may overstate demand because applicants have placed their names on the list several times to improve their chances. Telephone mainline faults refer to the number of reported faults per 100 main telephone lines. It is calculated by the total number of reported faults for the year divided by the number of telephone mainlines and multiplied by 100. The definition of fault varies among countries: some operators define faults as including malfunctioning customer equipment while others include only technical faults. 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.

In addition to waiting list and mainline faults, the table includes two other measures of efficiency in telecommunications: 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 mobile phones or radio, paging, and data services; and there are definitional and accounting differences between countries.

5.10a

Mobile phone subscribers are approaching (or surpassing) 500 per 1,000 people in some developing and transition economies



Source: World Bank data files, based on International Telecommunication Union data.

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. • **Telephone mainline faults** is the number of reported faults per 100 telephone mainlines. • **Telephone 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 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 portable telephone subscribers to an automatic public mobile telephone service using cellular technology that provides access to the public switched telephone network, per 1,000 people. • **International telecommunications 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, fixed line 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 2000–2001,* the IEA's *Energy Statistics of OECD Countries 2000–2001,* and the United Nations Statistics Division's *Energy Statistics Yearbook.* The telecommunications data are from the International Telecommunication Union's *World Telecommunication Development Report 2003.*

5.11 The information age

	Daily newspapers	Radios	Television [a]		Personal computers		Internet				Information and communications technology expenditures	
								Total monthly price [a]				
	per 1,000 people 2000	per 1,000 people 2001	Sets per 1,000 people 2002	Cable subscribers per 1,000 people 2002	per 1,000 people [a] 2002	In education number 2002	Users per 1,000 people [a] 2002	20 hours of use $ 2003	% of monthly GNI per capita 2003	Secure servers number 2003	% of GDP 2002	Per capita $ 2002
Afghanistan	*5*	*114*	*14*	*0.0*	..	..	0	..	..	1	..	..
Albania	*35*	*260*	318	2.3	11.7	..	4	29	24.8	1	..	..
Algeria	*27*	*244*	*114*	0.0	7.7	..	16	18	12.4	4	..	..
Angola	*11*	*78*	*52*	*0.9*	1.9	..	3	79	143.3	1	..	..
Argentina	*37*	*681*	*326*	*162.9*	82.0	98,635	112	13	3.9	274	3.9	95
Armenia	5	*264*	*229*	*1.2*	15.8	..	16	45	68.0	2	..	..
Australia	*293*	1,996	*731*	76.3	565.1	672,471	482	18	1.1	5,749	6.4	1,298
Austria	*296*	*763*	637	132.0	369.3	196,210	409	33	1.7	1,156	5.3	1,322
Azerbaijan	*27*	*22*	332	0.6	..	..	37	108	183.0	1	..	..
Bangladesh	*53*	*49*	59	27.0	3.4	..	2	20	66.8	1	..	..
Belarus	*152*	199	*362*	77.2	..	..	82	13	11.3	6	..	..
Belgium	*160*	*793*	541	374.7	241.4	285,395	328	29	1.5	576	5.5	1,324
Benin	*5*	445	*12*	..	2.2	..	7	46	146.5	*1*	..	..
Bolivia	*55*	*667*	*121*	*9.7*	22.8	..	32	22	29.8	10	..	..
Bosnia and Herzegovina	*152*	*243*	*116*	19.4	..	..	26	7	6.9	4	..	..
Botswana	*27*	*150*	*44*	..	40.7	..	*30*	27	10.9	..	..	..
Brazil	*43*	*433*	*349*	*13.8*	74.8	774,363	82	28	11.8	1,580	8.3	205
Bulgaria	*116*	*543*	*453*	93.5	51.9	*22,078*	81	12	8.3	24	6.9	146
Burkina Faso	*1*	433	79	0.0	1.6	..	2	45	247.5	..	..	..
Burundi	*2*	*220*	31	0.0	0.7	..	1	81	971.3	..	..	..
Cambodia	*2*	*119*	*8*	..	2.0	..	2	57	245.8	1	..	..
Cameroon	*7*	*161*	*75*	..	5.7	..	4	52	110.7	1	..	..
Canada	*159*	*1,047*	*691*	*252.9*	487.0	1,306,715	513	13	0.7	10,785	5.9	1,352
Central African Republic	*2*	*80*	6	..	2.0	..	1	175	807.9	..	..	..
Chad	*0*	*233*	2	..	1.7	..	2	69	375.6	..	..	..
Chile	*98*	*759*	523	57.4	119.3	131,024	238	22	6.1	233	5.7	246
China	..	*339*	350	75.0	27.6	3,555,157	46	10	13.0	182	5.8	58
Hong Kong, China	*792*	*686*	*504*	90.6	422.0	173,161	430	4	0.2	768	4.6	1,025
Colombia	*46*	549	303	*13.6*	49.3	167,461	46	19	12.2	105	6.7	114
Congo, Dem. Rep.	*3*	*385*	*2*	..	..	..	1	74	986.7	..	..	..
Congo, Rep.	*8*	*109*	*13*	..	3.9	..	2	121	207.8	..	..	..
Costa Rica	*91*	*816*	*231*	..	197.2	12,320	193	26	7.6	144	..	..
Côte d'Ivoire	*16*	185	*61*	*0.0*	9.3	..	5	67	132.1	1	..	..
Croatia	*114*	*339*	*293*	8.1	173.8	..	180	17	4.4	107	7.5	364
Cuba	*118*	185	*251*	..	31.8	..	*11*	58	32.2	1	..	..
Czech Republic	*254*	*803*	*538*	*94.4*	177.4	62,900	256	21	4.5	229	7.2	489
Denmark	283	1,400	*859*	*201.4*	576.8	276,813	513	18	0.7	998	5.8	1,852
Dominican Republic	27	*181*	..	..	..	44,792	36	33	17.1	22	..	..
Ecuador	96	422	237	33.8	31.1	99,334	42	32	26.3	23	..	..
Egypt, Arab Rep.	*31*	*339*	229	0.0	16.6	*48,816*	28	5	4.5	17	3.3	38
El Salvador	*28*	*481*	*233*	*49.7*	25.2	..	46	48	27.8	23	..	..
Eritrea	..	464	50	0.0	2.5	..	2	27	200.9	..	..	..
Estonia	*176*	1,136	502	107.0	210.3	..	328	14	3.9	89	..	..
Ethiopia	*0*	*189*	*6*	*0.0*	1.5	..	1	27	329.1	2	..	..
Finland	445	*1,624*	670	199.7	441.7	210,163	509	23	1.2	932	5.8	1,464
France	*201*	*950*	*632*	57.5	347.1	1,682,650	314	14	0.8	2,860	5.2	1,246
Gabon	*30*	*488*	308	11.5	19.2	..	19	122	46.9	3	..	..
Gambia, The	*2*	*394*	*15*	..	13.8	..	18	27	116.2	..	..	..
Georgia	5	*568*	357	12.4	31.6	..	15	26	48.4	4	..	..
Germany	*305*	570	661	249.9	431.3	2,379,660	412	14	0.7	8,451	5.2	1,252
Ghana	*14*	*695*	*53*	*0.3*	3.8	..	8	44	194.8	5	..	..
Greece	*23*	*478*	*519*	0.0	81.7	117,911	155	38	3.9	205	4.8	604
Guatemala	*33*	*79*	*145*	..	14.4	8,310	33	31	21.4	36	..	..
Guinea	..	52	*47*	*0.0*	5.5	..	5	63	185.2	..	..	..
Guinea-Bissau	*5*	178	*36*	..	..	..	4	105	840.7	..	..	..
Haiti	*3*	18	*6*	*4.8*	..	..	10	130	354.5	3	..	..

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	Daily newspapers	Radios	Television [a]		Personal computers		Internet				Information and communications technology expenditures	
								Total monthly price [a]				
	per 1,000 people 2000	per 1,000 people 2001	Sets per 1,000 people 2002	Cable subscribers per 1,000 people 2002	per 1,000 people [a] 2002	In education number 2002	Users per 1,000 people [a] 2002	20 hours of use $ 2003	% of monthly GNI per capita 2003	Secure servers number 2003	% of GDP 2002	Per capita $ 2002
Honduras	*55*	*411*	119	21.6	13.6	..	25	41	52.9	16	..	..
Hungary	*465*	*690*	*475*	170.1	108.4	52,452	158	10	2.3	139	6.4	420
India	*60*	*120*	*83*	*38.9*	7.2	347,801	16	9	21.9	281	2.8	13
Indonesia	*23*	*159*	*153*	*0.3*	11.9	58,593	38	22	37.6	60	1.5	11
Iran, Islamic Rep.	*28*	*281*	173	..	75.0	..	48	6	4.2	1	..	..
Iraq	*19*	*222*	*83*	..	8.3	..	1	..	..	..	..	..
Ireland	*150*	*695*	694	143.0	420.8	141,360	271	28	1.4	784	4.0	1,256
Israel	*290*	*526*	*330*	184.0	242.6	..	301	30	2.1	562	6.9	1,173
Italy	*104*	*878*	*494*	*1.4*	230.7	1,109,182	352	17	1.0	1,430	4.4	898
Jamaica	*62*	*795*	*374*	..	53.9	..	229	44	18.5	12	..	..
Japan	*578*	*956*	785	183.1	382.2	2,292,417	449	21	0.8	11,878	5.3	1,671
Jordan	*75*	*372*	177	*0.3*	37.5	..	58	26	18.0	9	..	..
Kazakhstan	..	*411*	*338*	6.6	..	..	16	34	27.4	3	..	..
Kenya	*10*	221	*26*	*0.5*	6.4	..	13	46	152.4	4	..	..
Korea, Dem. Rep.	*208*	*154*	162	*0.0*	..	..	*0*	..	..	..	..	..
Korea, Rep.	*393*	*1,034*	*363*	*132.0*	555.8	857,233	552	10	1.2	688	6.5	645
Kuwait	*374*	*570*	*418*	..	120.6	..	106	25	2.0	38	..	..
Kyrgyz Republic	27	*110*	*49*	3.1	12.7	..	30	15	62.1	1	..	..
Lao PDR	*4*	*148*	*52*	*0.0*	3.3	..	3	32	123.4	..	..	..
Latvia	135	*700*	850	132.2	171.7	..	133	58	20.0	53	..	..
Lebanon	*107*	182	*357*	*29.9*	80.5	..	117	37	11.1	16	..	..
Lesotho	*8*	*61*	35	..	..	..	10	43	110.7	..	..	..
Liberia	*12*	*274*	*25*	..	..	..	*0*	..	..	..	..	..
Libya	*15*	*273*	*137*	..	23.4	..	23	19	3.8	..	..	..
Lithuania	29	*524*	487	75.1	109.7	..	144	34	11.2	29	..	..
Macedonia, FYR	*21*	*205*	*282*	..	..	..	48	19	13.3	..	..	..
Madagascar	*5*	*216*	25	..	4.4	..	3	67	336.7	1	..	..
Malawi	*3*	*499*	*4*	*0.0*	1.3	..	3	62	465.0	..	..	..
Malaysia	*158*	*420*	210	*0.0*	146.8	241,392	320	8	2.9	174	7.3	304
Mali	*1*	180	33	..	1.4	..	2	58	289.8	*1*	..	..
Mauritania	*0*	*148*	*99*	..	10.8	..	4	39	113.1	*1*	..	..
Mauritius	119	*379*	*299*	..	116.5	..	99	15	4.7	17	..	..
Mexico	94	*330*	*282*	24.3	82.0	302,325	98	23	4.6	416	4.4	2,097
Moldova	13	*758*	*296*	13.3	17.5	..	34	19	49.6	7	..	..
Mongolia	*30*	50	79	18.5	28.4	..	21	18	48.6	3	..	..
Morocco	28	*243*	*167*	..	23.6	..	24	25	25.5	15	..	..
Mozambique	*2*	*44*	14	..	4.5	..	*2*	51	290.2	2	..	..
Myanmar	*9*	66	8	..	5.1	..	1	43	180.9	..	..	..
Namibia	*19*	*134*	269	16.0	70.9	..	27	33	22.5	9	..	..
Nepal	*12*	*39*	*8*	..	3.7	..	3	13	70.3	2	..	..
Netherlands	*306*	*980*	648	401.4	466.6	652,319	506	24	1.2	58	5.8	1,505
New Zealand	362	*992*	*557*	*7.1*	413.8	196,364	484	13	1.1	1,276	7.4	1,096
Nicaragua	*30*	*270*	*123*	*10.8*	27.9	..	17	51	138.6	8	..	..
Niger	*0*	*122*	*10*	..	0.6	..	1	97	683.6	..	..	..
Nigeria	*24*	*200*	*103*	*0.5*	7.1	..	3	85	353.7	3	..	..
Norway	569	3,324	*884*	184.5	528.3	268,861	503	26	0.8	726	4.1	1,703
Oman	*29*	*621*	553	0.0	35.0	..	66	24	3.8	1	..	..
Pakistan	*40*	*105*	*150*	*0.2*	*4.2*	..	10	16	45.7	25	..	..
Panama	*62*	*300*	191	..	38.3	15,253	*41*	36	10.7	85	..	..
Papua New Guinea	*14*	*86*	*21*	*4.2*	58.7	..	14	20	45.3	..	..	..
Paraguay	*43*	*188*	*218*	*21.3*	34.6	..	17	36	37.3	4	..	..
Peru	*0*	*269*	172	16.6	43.0	32,308	93	33	19.2	73	..	..
Philippines	*82*	*161*	182	37.0	27.7	125,055	44	17	20.1	97	4.2	40
Poland	102	*523*	*422*	91.4	105.6	109,598	230	16	4.1	389	5.2	256
Portugal	*32*	*301*	*413*	122.1	134.9	169,230	194	21	2.3	319	5.8	697
Puerto Rico	*126*	*761*	*339*	*91.2*	..	302,941	*156*	..	..	*63*	..	..

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	Daily newspapers	Radios	Television [a]		Personal computers		Internet				Information and communications technology expenditures	
								Total monthly price [a]				
	per 1,000 people 2000	per 1,000 people 2001	Sets per 1,000 people 2002	Cable subscribers per 1,000 people 2002	per 1,000 people [a] 2002	In education number 2002	Users per 1,000 people [a] 2002	20 hours of use $ 2003	% of monthly GNI per capita 2003	Secure servers number 2003	% of GDP 2002	Per capita $ 2002
Romania	*300*	*358*	697	152.2	69.2	*36,754*	83	26	17.1	30	4.3	88
Russian Federation	*105*	*418*	*538*	43.6	88.7	229,630	41	10	5.6	233	3.7	88
Rwanda	*0*	*85*	..	..	..	..	3	67	348.3	*1*	..	..
Saudi Arabia	*326*	*326*	265	0.3	130.2	..	62	35	4.9	26	4.6	369
Senegal	*5*	128	*78*	*0.1*	19.8	..	10	41	103.7	3	..	..
Serbia and Montenegro	*107*	*297*	*282*	..	27.1	..	60	13	11.3	6	..	..
Sierra Leone	*4*	*259*	*13*	..	..	..	2	12	102.9	*1*	..	..
Singapore	*298*	*672*	303	84.5	622.0	136,000	504	11	0.6	732	6.5	1,268
Slovak Republic	131	*965*	*409*	127.3	180.4	*27,729*	160	21	6.3	48	5.8	251
Slovenia	169	*405*	366	160.3	300.6	*28,842*	376	25	3.1	96	4.9	556
Somalia	*1*	*60*	*14*	..	..	..	9	..	..	..	..	..
South Africa	*32*	*336*	177	0.0	72.6	*364,722*	68	33	15.4	648	9.2	225
Spain	100	*330*	*564*	19.9	196.0	636,590	156	21	1.7	1,964	4.5	734
Sri Lanka	*29*	*215*	*117*	*0.3*	13.2	..	11	15	21.5	23	..	..
Sudan	*26*	461	386	0.0	6.1	..	3	161	550.8	..	..	..
Swaziland	*26*	*161*	34	..	24.2	..	19	21	21.0	2	..	..
Sweden	410	2,811	*965*	246.0	621.3	541,805	573	22	1.1	1,595	6.5	1,765
Switzerland	*373*	*1,002*	*552*	376.2	708.7	405,134	351	22	0.7	1,931	6.2	2,259
Syrian Arab Republic	*20*	*276*	182	0.0	19.4	..	13	55	58.6	*1*	..	..
Tajikistan	*20*	*141*	*357*	0.1	..	..	1	54	362.3	..	..	..
Tanzania	*4*	406	*45*	*0.2*	4.2	..	2	117	501.4	..	..	..
Thailand	*64*	*235*	*300*	12.9	39.8	230,000	78	7	4.2	179	4.7	94
Togo	2	*263*	123	..	30.8	..	41	30	134.9	..	..	..
Trinidad and Tobago	*123*	*534*	*345*	..	79.5	..	106	13	2.5	13	..	..
Tunisia	19	*158*	*207*	..	30.7	..	52	17	10.4	13	..	..
Turkey	*111*	470	423	14.2	44.6	*123,907*	73	20	9.5	496	4.6	122
Turkmenistan	7	*279*	*182*	..	..	..	*2*	20	20.2	..	..	..
Uganda	*2*	*122*	18	*0.3*	3.3	..	4	97	464.4	2	..	..
Ukraine	175	*889*	*456*	38.6	19.0	..	18	17	26.0	28	..	..
United Arab Emirates	*156*	*330*	*252*	..	129.0	..	337	13	0.8	83	..	..
United Kingdom	*329*	*1,445*	*950*	57.2	405.7	2,099,346	423	24	1.1	13,540	6.1	1,600
United States	213	*2,117*	*938*	255.0	658.9	19,787,772	551	15	0.5	138,514	6.5	2,358
Uruguay	*293*	*603*	*530*	125.9	110.1	..	119	26	7.3	39	..	..
Uzbekistan	*3*	*456*	*280*	3.7	..	..	11	20	53.8	1	..	..
Venezuela, RB	*206*	*294*	*186*	36.3	60.9	104,297	51	19	5.7	106	4.4	147
Vietnam	*4*	*109*	*197*	..	*9.8*	29,516	*18*	20	55.4	3	2.4	10
West Bank and Gaza	..	..	*148*	*0.0*	36.2	..	30	25	32.8	..	..	..
Yemen, Rep.	*15*	*65*	*308*	..	7.4	..	5	31	75.3	1	..	..
Zambia	*12*	*179*	*51*	1.2	7.5	..	5	33	118.7	..	..	..
Zimbabwe	*18*	*362*	56	2.1	51.6	..	43	23	58.3	7	..	..
World	**.. w**	***419* w**	**275 w**	**65.5 w**	**100.8 w**		**131 u**	**37 u**	**88.7 u**	**217,255 s**		
Low income	*40*	*139*	*91*	*23.7*	7.5		10	57	246.4	435		
Middle income	..	*360*	326	57.6	45.4		80	29	18.9	6,686		
Lower middle income	..	*346*	326	58.9	37.7		46	29	24.9	3,965		
Upper middle income	*123*	*466*	*326*	47.1	100.5		149	30	8.6	2,721		
Low & middle income	..	*257*	*190*	*40.2*	28.4		50	41	114.8	7,121		
East Asia & Pacific	..	*287*	317	70.1	26.3		44	31	66.1	720		
Europe & Central Asia	*102*	*447*	*407*	47.6	73.4		87	26	39.5	1,930		
Latin America & Carib.	*70*	*410*	*289*	*33.9*	67.4		92	33	31.8	3,309		
Middle East & N. Africa	*33*	*277*	*200*	..	38.2		37	31	29.9	103		
South Asia	*60*	*112*	*84*	*37.3*	6.8		14	30	58.6	333		
Sub-Saharan Africa	*12*	*198*	*69*	*0.3*	11.9		16	64	268.8	726		
High income	*284*	*1,266*	*735*	191.0	466.9		364	23	1.6	210,134		
Europe EMU	*209*	*813*	*597*	158.1	317.5		331	24	1.5	18,846		

a. Data are from the International Telecommunication Union's (ITU) *World Telecommunication Development Report 2003.* Please cite the ITU for third-party use of these data.

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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. This table presents indicators of the penetration of the information economy—newspapers, radios, televisions, personal computers, and Internet use—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 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, the World Information Technology and Services Alliance, and the International Data Corporation. 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 them, the data on licensed sets may understate the true number.

The estimates of personal computers are derived from an annual ITU questionnaire, supplemented by other sources. In many countries mainframe computers are used extensively. Since thousands of users can be connected to a single mainframe computer, the number of personal computers understates the total use of computers.

The data on Internet users are based on estimates derived from reported counts of Internet service subscribers or calculated by multiplying the number of Internet hosts by an estimated multiplier. Internet hosts are computers connected directly to the worldwide 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 out computers connected to the Internet or pre-paid cards are used to access 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 the total monthly Internet price, which refers to the sum of Internet service provider (ISP) charges and telephone usage charges. The Internet price is also calculated as a percentage of monthly GNI per capita. Data are generally derived from the prices listed by the largest ISP and incumbent telephone company. 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. These account for 98 percent of global spending.

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 by the ITU. 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.

Definitions

• **Daily newspapers** refer to those published at least four times a week and calculated as average circulation (or copies printed) per 1,000 people. • **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 in education** are those installed in primary and secondary schools and universities. • **Internet users** are people with access to the worldwide network. • **Total monthly price** refers to the sum of ISP and telephone usage charges for 20 hours of use and as a percentage of monthly GNI per capita. • **Secure servers** are servers using encryption technology in Internet transactions. • **Information and communications technology expenditures** cover 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 the UNESCO Institute for Statistics. The data on television sets, cable television subscribers, personal computers, Internet users, and Internet access charges are from the ITU and are reported in the ITU's *World Telecommunication Development Report 2003* and the *World Telecommunications Indicators Database* (2003). The data on personal computers 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), and the International Data Corporation. The data on secure servers are from Netcraft (http://www.netcraft.com/).

5.12 Science and technology

	Researchers in R&D	Technicians in R&D	Scientific 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 1990–2001 [c]	per million people 1990–2001 [c]	1999	% of GDP 1996–2002 [c]	$ millions 2002	% of manufactured exports 2002	Receipts $ millions 2002	Payments $ millions 2002	Residents 2001	Non-residents 2001	Residents 2001	Non-residents 2001
Afghanistan	..	..	0	..	..	..	..	..	..	..	..	..
Albania	..	..	17	..	2	1	..	..	0	129,865	0	2,070
Algeria	..	..	162	..	*21*	*4*	..	..	52	72,257	1,418	3,284
Angola	..	..	3	..	..	..	*4*	*0*	..	..	..	..
Argentina	684	149	2,361	0.42	583	7	17	225	*0*	*6,634*	..	..
Armenia	1,534	223	142	0.2	3	2	..	..	155	75,502	510	2,696
Australia	3,439	792	12,525	1.53	2,945	16	304	1,012	10,244	84,929	25,159	13,893
Austria	2,313	979	3,580	1.93	8,433	15	111	1,053	3,358	229,823	7,544	11,818
Azerbaijan	2,799	160	66	0.37	10	8	..	2	0	75,462	0	2,055
Bangladesh	51	32	148	..	*10*	*0*	0	3	..	..	..	..
Belarus	1,893	273	564	..	212	4	1	3	945	75,750	1,885	4,846
Belgium	2,953	1,157	4,896	1.98	*15,736*	*11*	*887*	*1,246*	1,953	154,676	21,382 [d]	12,510 [d]
Benin	174	53	20	..	*0*	*0*	*0*	*1*	..	..	..	..
Bolivia	123	6	33	0.34	15	7	2	6	..	..	..	..
Bosnia and Herzegovina	..	..	9	..	..	..	..	..	52	76,362	152	4,298
Botswana	..	..	41	..	*6*	*0*	..	..	2	56	..	..
Brazil	323	129	5,144	1.05	*6,007*	*19*	100	1,229	6,706	87,301	85,098	16,415
Bulgaria	1,167	472	801	0.55	*85*	*3*	4	23	291	77,331	3,508	5,894
Burkina Faso	16	15	23	0.19	*2*	*7*	..	*0*	..	..	..	..
Burundi	21	32	3	..	*0*	*2*	0	0	..	..	..	..
Cambodia	..	..	5	..	..	..	..	6	..	..	231	1,268
Cameroon	3	4	61	..	1	1	..	..	..	..	..	..
Canada	2,978	1,035	19,685	1.94	22,662	14	1,689	3,651	5,737	92,752	17,314	21,778
Central African Republic	47	27	4	..	..	..	..	..	..	..	..	..
Chad	..	..	2	..	..	..	..	..	..	..	..	..
Chile	419	307	879	0.54	*107*	*3*	6	345	*241*	*2,879*	..	..
China	584	202	11,675	1.09	68,182	23	133	3,114	30,324	118,970	229,775	30,149
Hong Kong, China	1,998	100	1,817	0.44	2,688	17	*196*	*491*	74	8,840	5,458	15,487
Colombia	101	48	207	0.17	319	7	4	87	63	44,882	7,265	7,096
Congo, Dem. Rep.	..	..	6	..	..	..	..	..	..	..	..	..
Congo, Rep.	33	37	13	..	..	..	..	..	..	..	..	..
Costa Rica	530	..	69	0.20	1,146	37	2	51	0	74,360	..	..
Côte d'Ivoire	..	..	40	..	27	3	0	10	..	..	..	..
Croatia	1,187	347	545	0.98	432	12	85	77	456	76,035	992	6,111
Cuba	489	2,393	192	0.65	*48*	*29*	..	..	4	75,687	0	2,090
Czech Republic	1,466	712	2,005	1.31	4,494	14	45	119	605	78,648	8,100	10,949
Denmark	3,476	2,594	4,131	2.15	8,089	22	..	..	3,770	229,151	3,646	8,351
Dominican Republic	..	..	6	..	..	*1*	..	24	..	..	..	..
Ecuador	83	72	20	0.09	34	7	..	44	0	28,909	4,832	5,011
Egypt, Arab Rep.	493	366	1,198	0.19	13	1	38	171	464	923	0	3,216
El Salvador	47	303	0	0.01	44	6	2	20	..	..	..	..
Eritrea	..	..	2	..	..	..	*0*	*0*	..	..	..	..
Estonia	1,947	387	261	0.66	375	12	5	14	25	77,142	910	5,617
Ethiopia	..	..	95	..	0	..	0	0	*3*	*4*	..	..
Finland	7,110	..	4,025	3.42	9,139	24	559	604	3,405	227,036	2,879	7,365
France	2,718	2,878	27,374	2.20	52,582	21	3,241	1,956	21,790	153,332	60,513	14,324
Gabon	..	..	20	..	*4*	*7*	..	..	..	..	..	..
Gambia, The	..	..	17	..	*0*	*3*	..	..	1	150,081	..	..
Georgia	2,421	97	112	0.33	*41*	*38*	6	11	257	76,207	218	3,114
Germany	3,153	1,345	37,308	2.50	86,861	17	3,765	5,064	80,222	212,176	63,645	14,235
Ghana	..	..	73	..	*3*	*3*	..	*0*	2	150,194	..	..
Greece	1,400	554	2,241	0.68	*524*	*10*	13	288	78	155,268	5,879	6,240
Guatemala	103	111	14	..	55	7	0	0	5	260	3,048	5,040
Guinea	..	..	2	..	*0*	*0*	0	1	..	..	..	..
Guinea-Bissau	..	..	6	..	..	..	..	..	*0*	..	..	..
Haiti	..	..	1	..	..	..	..	..	*1*	*5*	..	..

5.12 Science and technology

	Researchers in R&D	Technicians in R&D	Scientific 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 1990–2001 [c]	per million people 1990–2001 [c]	1999	% of GDP 1996–2002 [c]	$ millions 2002	% of manufactured exports 2002	Receipts $ millions 2002	Payments $ millions 2002	Residents 2001	Non-residents 2001	Residents 2001	Non-residents 2001
Honduras	73	256	11	..	5	2	0	11	7	155	..	..
Hungary	1,440	510	1,958	0.95	7,364	25	350	399	1,019	78,181	4,755	10,673
India	157	115	9,217	..	*1,788*	5	12	350	234	78,288	..	..
Indonesia	..	..	142	..	5,070	16	..	..	0	77,407	..	..
Iran, Islamic Rep.	590	174	624	..	64	3	*0*	*0*	691	302	9,858	1,224
Iraq	..	..	21	..	..	..	..	..	..	..	..	..
Ireland	2,190	588	1,237	1.16	31,624	41	249	10,347	1,334	155,155	918	3,038
Israel	1,563	516	5,025	4.96	5,414	20	389	450	2,378	82,027	2,468	6,468
Italy	1,128	808	17,149	1.07	19,872	9	539	1,273	3,819	153,039	0	11,005
Jamaica	..	..	44	..	*1*	0	6	32	3	66	599	2,394
Japan	5,321	667	47,826	3.09	94,730	24	10,422	11,021	388,390	108,231	104,655	19,133
Jordan	1,948	717	204	6.33	48	3	..	..	..	..	..	..
Kazakhstan	716	293	104	0.29	*157*	*10*	0	19	1,610	75,560	1,796	3,300
Kenya	..	..	252	..	35	10	*5*	*62*	2	150,443	0	1,442
Korea, Dem. Rep.	..	..	1	..	..	..	..	..	0	74,672	0	2,587
Korea, Rep.	2,880	564	6,675	2.96	46,438	32	826	2,979	74,001	116,021	86,408	20,729
Kuwait	212	53	260	0.20	..	..	0	0	..	..	..	..
Kyrgyz Republic	581	49	10	0.19	6	6	3	3	84	75,489	59	2,382
Lao PDR	..	..	2	..	..	..	..	..	..	..	14	563
Latvia	1,078	298	153	0.40	51	4	3	6	124	130,315	1,062	6,133
Lebanon	..	..	100	..	*16*	*3*	..	..	*0*	*104*	..	..
Lesotho	..	..	1	..	..	..	11	0	1	150,361	0	1,009
Liberia	..	..	1	..	..	..	..	..	0	76,005	0	1,018
Libya	361	493	19	..	..	..	..	..	..	..	..	..
Lithuania	2,303	492	214	0.63	*130*	*5*	0	11	70	130,287	1,323	5,994
Macedonia, FYR	387	29	36	..	*9*	*1*	3	10	66	129,995	440	3,962
Madagascar	15	46	..	0.13	..	..	0	13	0	76,048	236	336
Malawi	..	..	36	..	*1*	*3*	0	0	2	150,687	146	515
Malaysia	160	45	416	0.40	*40,912*	58	12	628	..	..	..	..
Mali	..	..	11	..	..	..	*0*	*1*	..	..	..	..
Mauritania	..	..	2	..	..	..	..	..	..	..	..	..
Mauritius	360	157	16	0.28	29	2	0	2	..	..	..	..
Mexico	225	183	2,291	0.43	28,939	21	48	720	594	81,876	43,788	21,147
Moldova	329	1,641	92	0.62	8	4	1	1	437	75,549	..	..
Mongolia	531	116	8	..	1	0	*0*	..	106	76,133	206	3,189
Morocco	..	..	386	..	*439*	11	11	41	0	74,468	0	3,499
Mozambique	..	..	14	..	*2*	*3*	*0*	*0*	1	146,278	0	1,162
Myanmar	..	..	10	..	..	..	*0*	*0*	..	..	..	..
Namibia	..	..	13	..	*6*	*1*	4	2	..	..	..	..
Nepal	..	..	39	..	*0*	*0*	..	..	..	..	..	..
Netherlands	2,572	..	10,441	1.95	33,667	28	1,962	2,612	8,107	150,825	..	..
New Zealand	2,197	776	2,375	1.03	388	10	89	347	920	82,362	8,382	12,232
Nicaragua	73	33	8	0.15	6	5	..	..	*9*	*136*	..	..
Niger	..	..	21	..	*0*	*8*	..	..	..	..	..	..
Nigeria	..	..	397	..	*0*	*0*	..	..	..	..	..	..
Norway	4,377	1,836	2,598	1.64	2,863	22	171	325	1,780	82,593	3,316	11,767
Oman	4	0	73	..	36	2	..	..	0	2,174	..	..
Pakistan	69	12	277	..	59	1	2	18	58	1,168	4,852	2,392
Panama	95	213	37	0.44	1	1	0	41	*7*	*153*	..	..
Papua New Guinea	..	..	36	..	*11*	*19*	..	..	..	..	..	..
Paraguay	166	231	4	0.00	*7*	3	184	1	..	..	..	..
Peru	229	1	56	0.11	24	2	2	56	*48*	*944*	6,940	6,983
Philippines	156	22	164	..	11,488	65	1	230	0	13,598	..	..
Poland	1,473	507	4,523	0.67	915	3	34	557	2,218	78,856	12,434	13,358
Portugal	1,754	506	1,508	0.78	*1,628*	7	32	294	189	230,719	7,191	9,682
Puerto Rico	..	..	..	..	..	..	..	..	..	..	..	..

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	Researchers in R&D	Technicians in R&D	Scientific 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	per million people		% of GDP	$ millions	% of manufactured exports	Receipts $ millions	Payments $ millions	Residents	Non-residents	Residents	Non-residents
	1990–2001 [c]	1990–2001 [c]	1999	1996–2002 [c]	2002	2002	2002	2002	2001	2001	2001	2001
Romania	879	584	785	0.40	390	3	3	85	1,148	130,602	5,374	7,208
Russian Federation	3,494	551	15,654	1.16	2,897	13	147	338	25,046	82,632	39,801	13,295
Rwanda	..	6	4	..	0	1	0	0	*0*	*4*	..	..
Saudi Arabia	..	..	528	..	*30*	0	0	0	46	683	..	..
Senegal	2	3	66	0.01	15	4	..	..	..	..	..	..
Serbia and Montenegro	2,389	515	546	..	..	..	..	..	470	77,043	971	6,022
Sierra Leone	..	..	3	..	..	..	..	..	1	150,465	0	1,038
Singapore	4,052	335	1,653	2.11	63,792	60	..	..	0	79,026	0	3,079
Slovak Republic	1,774	790	871	0.62	386	3	*16*	*58*	260	77,131	2,158	8,958
Slovenia	2,258	877	599	1.63	488	5	7	78	344	130,599	1,009	7,481
Somalia	..	..	0	..	..	..	..	..	..	..	..	..
South Africa	992	303	2,018	..	740	5	43	94	175	76,571	..	..
Spain	1,948	1,019	12,289	0.96	*6,777*	7	370	1,810	3,814	230,729	73,937	15,263
Sri Lanka	191	46	84	0.18	19	1	..	..	0	76,095	..	..
Sudan	..	..	43	..	4	7	*0*	*0*	5	150,388	0	1,063
Swaziland	..	..	6	..	*3*	1	0	46	1	75,091	0	1,054
Sweden	5,186	3,164	8,326	4.61	10,760	16	1,505	888	7,133	224,350	6,603	8,552
Switzerland	3,592	1,399	6,993	2.64	17,077	21	..	..	7,323	226,329	7,665	17,053
Syrian Arab Republic	29	24	55	0.18	*2*	1	..	..	0	0	0	0
Tajikistan	660	..	20	..	*37*	*42*	0	1	0	75,462	0	1,965
Tanzania	..	..	92	..	*1*	*2*	0	0	2	148,738	0	16
Thailand	74	74	470	0.10	*15,234*	*31*	7	1,104	*1,117*	*4,548*	..	..
Togo	102	65	11	..	*1*	1	*0*	*1*	..	..	..	..
Trinidad and Tobago	456	882	37	0.14	*75*	*3*	..	..	1	76,045	..	..
Tunisia	336	32	237	0.45	*177*	4	16	6	0	195	..	..
Turkey	306	26	2,761	0.64	568	2	0	107	425	228,914	19,885	8,544
Turkmenistan	..	..	0	..	*8*	*5*	..	..	0	75,440	0	1,803
Uganda	24	14	59	0.75	4	12	0	..	2	150,406	0	14
Ukraine	2,118	594	2,194	0.95	572	5	4	110	7,234	77,196	6,854	7,320
United Arab Emirates	..	..	118	..	*17*	*2*	..	..	0	75,414	..	..
United Kingdom	2,666	1,014	39,711	1.90	71,481	31	7,701	5,993	34,500	230,206	50,601	20,490
United States	4,099	..	163,526	2.80	162,345	32	44,142	19,258	190,907	184,750	181,713	34,861
Uruguay	276	52	144	0.24	19	3	0	10	*44*	*572*	..	..
Uzbekistan	1,754	312	236	..	..	..	..	..	803	76,432	690	2,723
Venezuela, RB	193	32	448	0.44	*94*	3	0	58	*56*	*2,292*	..	..
Vietnam	274	..	98	..	..	..	..	..	0	76,542	0	2,422
West Bank and Gaza	..	..	..	..	..	..	..	..	..	..	..	..
Yemen, Rep.	..	..	10	..	..	..	..	..	..	..	..	..
Zambia	..	..	26	..	2	2	..	*0*	8	3,178	213	617
Zimbabwe	..	..	85	..	21	3	..	..	2	150,320	1	17
World	**.. w**	**.. w**	**528,627 s**	**2.46 w**	***1,149,146* s**	**21 w**	**79,611 s**	**82,187 s**	**939,267 s**	**10,814,596 s**	**1,263,071 s**	**630,592 s**
Low income	..	..	12,040	..	..	9	36	420	2,008	2,642,403	6,866	33,611
Middle income	818	..	64,710	0.66	*182,644*	19	1,361	10,299	81,357	3,317,058	505,531	247,653
Lower middle income	810	..	46,694	0.89	*97,450*	17	753	7,034	75,937	2,057,922	430,009	158,713
Upper middle income	662	..	18,016	0.53	*84,405*	21	608	3,265	5,420	1,259,136	75,522	88,940
Low & middle income	..	..	76,750	0.57	..	17	1,397	10,718	83,365	5,959,461	512,397	281,264
East Asia & Pacific	584	202	13,055	1.09	..	32	153	5,082	30,430	437,322	230,226	40,178
Europe & Central Asia	2,069	..	34,679	0.96	*16,726*	10	695	1,898	43,800	2,493,388	113,877	151,290
Latin America & Carib.	..	..	12,018	0.52	*38,457*	16	407	2,980	7,383	766,888	151,570	66,176
Middle East & N. Africa	..	..	3,617	..	*880*	2	65	218	1,253	151,002	11,276	11,223
South Asia	158	113	9,769	..	..	4	18	371	292	155,551	4,852	3,096
Sub-Saharan Africa	..	..	3,612	..	..	*4*	59	169	207	1,955,310	596	9,301
High income	3,284	..	451,877	2.64	*853,545*	23	78,214	71,469	855,902	4,855,135	750,674	349,328
Europe EMU	2,302	996	122,077	2.13	*278,406*	17	10,963	25,404	128,297	2,283,274	243,888	105,480

Note: The original information on patent and trademark applications was provided by the World Intellectual Property Organization (WIPO). The International Bureau of WIPO assumes no responsibility with respect to the transformation of these data.
a. Other patent applications filed in 2001 include those filed under the auspices of the African Regional Industrial Property Organization (ARIPO) (5 by residents, 75,101 by nonresidents), European Patent Office (67,330 by residents, 90,960 by nonresidents), and the Eurasian Patent Organization (491 by residents, 75,355 by nonresidents). b. Other trademark applications filed in 2001 include those filed under the auspices of the Office for Harmonization in the Internal Market (30,543 by residents, 18,342 by nonresidents) and ARIPO (6 by residents, 18 by nonresidents). c. Data are for the latest year available. d. Includes Luxembourg and the Netherlands.

Science and technology 5.12

About the data

The best opportunities to improve living standards, including new ways of reducing poverty, will come from science and technology. Science, advancing rapidly in virtually all fields—particularly in biotechnology—is playing a growing economic role: countries able to access, generate, and apply relevant scientific knowledge will have a competitive edge over those that cannot. And there is greater appreciation of the need for high-quality scientific input into public policy issues such as regional and global environmental concerns. Technological innovation, often fueled by government-led research and development (R&D), has been the driving force for industrial growth around the world.

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, and the number of patent and trademark applications filed.

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) collects data on scientific researchers 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 researchers and technicians or the number of economically active people qualified as such. UNESCO supplements these data with estimates of qualified researchers by counting people who have completed education at International Standard Classification of Education (ISCED) 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 information does not reflect the quality of training and education, which 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 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.

The method 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 expenditure 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 method 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.) Moreover, the R&D for high-technology exports may not have occurred in the reporting country.

Most countries have adopted systems that protect patentable inventions. Under most patent legislation an idea, to be protected by law (patentable), 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 nonresidents of the country.

A trademark provides protection to its 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 by paying additional fees. The trademark system helps consumers identify and purchase a product or service whose nature and quality, indicated by its unique trademark, meet their needs.

Definitions

• **Researchers in R&D** are people engaged in professional R&D activity who have received tertiary level training to work in any field of science. • **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. • **Scientific and technical journal articles** refer to scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical 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, 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, nonproduced, nonfinancial assets and proprietary rights (such as patents, copyrights, trademarks, franchises, and industrial processes) and for the use, through licensing agreements, of produced originals of prototypes (such as films and manuscripts). • **Patent applications filed** are applications filed with a national patent office for exclusive rights to 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. • **Trademark applications filed** are applications for registration of a trademark with a national or regional trademark office. Trademarks are distinctive signs that identify goods or services as those produced or provided by a specific person or enterprise. A trademark provides protection to the owner of the mark by ensuring the exclusive right to use it to identify goods or services or to authorize another to use it in return for payment.

Data sources

The data on technical personnel 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 2002.* The information on high-technology exports is from the United Nations Statistics Division's 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.*