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Indicators of Development Sustainability



Classical economists consistently identified three sources and components of national wealth: land, labor, and capital. By contrast, Western economists of the 20th century preferred to focus on **capital**, understood to be human-made **physical capital** only—the stock of structures and equipment used for production. Thus expenses aimed at adding to this stock were the only expenses categorized as **investment**. Most other expenses, such as those for education or for environmental protection, were considered to constitute consumption and treated as deductions from potential capital accumulation.

A better understanding of the need for sustainable development first led to attempts to “green” national accounts—that is, to account for changes in **natural capital** in calculations of **gross domestic product** and **gross national product**—then to the development of statistical methods to account for changes in a country’s **human capital**. Although valuation methods for natural and human capital are still imperfect, they allow experts to explore some critical development issues. These include the changing composition of a country’s national wealth and operational indica-

tors of sustainable—or unsustainable—development.

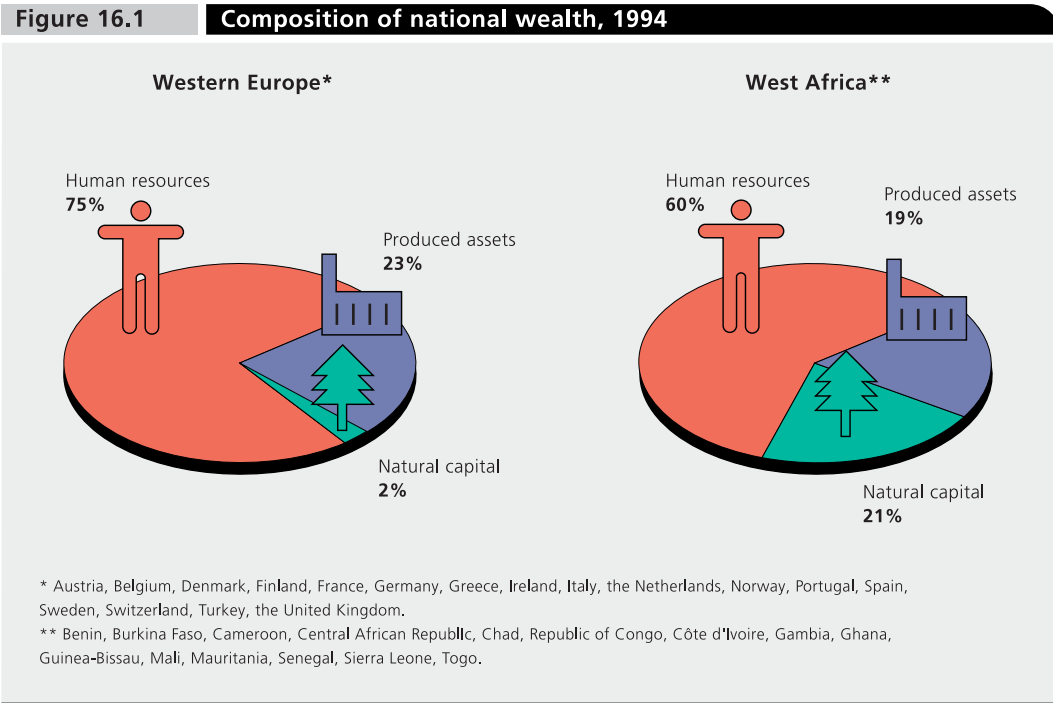
Composition of National Wealth

According to a number of recent World Bank studies, physical capital (produced assets) is not the main—much less the only—component of a country’s wealth. Most important for all countries are human resources, which consist of “raw labor,” determined mainly by the number of people in a country’s **labor force**, and human capital. Natural capital is another important component of every nation’s wealth.

A country’s level of development determines the roles played by the different components of its national wealth. The dominance of human capital is particularly marked in the most developed countries, where natural capital is calculated to account for just 2–5 percent of aggregate wealth. By contrast, in West Africa—one of the world’s poorest regions—natural capital still prevails over physical capital, and the share of human resources is among the lowest in the world despite a large population (see Fig. 16.1).

Comparing West Africa with Western

How does the structure of national wealth change as a country develops?



Europe is particularly indicative because in absolute terms the two regions have roughly the same per capita value for natural capital. Thus the striking difference in the composition of their national wealth can be entirely attributed to the fact that the average West European has 13–14 times as much human and physical capital at his or her disposal.

Accumulation of National Wealth as an Indicator of Sustainable Development

Over the past 10 years the concept of sustainable development has become more comprehensive and measurable. A recent World Bank study defined sustainable development as “a process of

managing a portfolio of assets to preserve and enhance the opportunities people face.” The assets that this definition refers to include not just traditionally accounted physical capital, but also natural and human capital. To be sustainable, development must provide for all these assets to grow over time—or at least not to decrease. The same logic applies to prudent management of a national economy as applies to prudent management of personal property.

With that definition in mind, one possible indicator of sustainable (or unsustainable) development might be the “genuine domestic saving rate” or “genuine domestic investment rate,” a new statistical indicator being calculated by World Bank experts for most countries and for

all the regions of the world. Standard measures of wealth accumulation ignore the depletion of, and damage to, **natural resources** such as forests and oil deposits, on the one hand, and investment in one of a nation's most valuable assets—its people—on the other. The genuine domestic **saving** (investment) rate is designed to correct for this shortcoming by adjusting the traditional domestic saving rate downward by an estimate of natural resource depletion and pollution damages (the loss of natural capital), and upward by growth in the value of human capital (which comes primarily from investing in education and basic health services). (See Fig. 16.2.)

Calculating genuine saving rates for different countries is extremely challenging, particularly because of difficulties

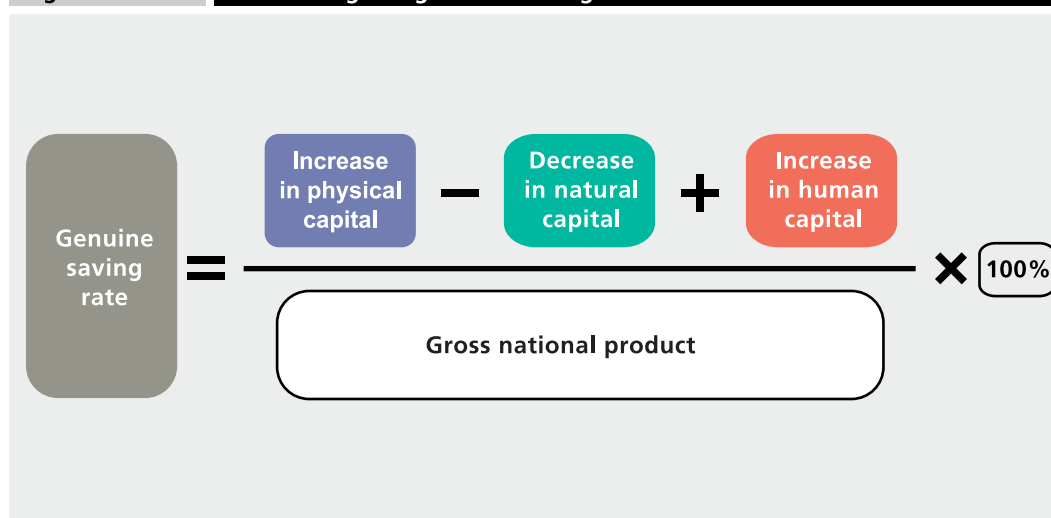
in valuating changes in their human and natural capital. But the effort is considered worthwhile because of the potential importance of sustainable development indicators for informing and guiding practical policymaking. In Data Table 5, please see the genuine domestic saving rates estimated by World Bank economists taking into account net domestic saving (**gross domestic saving** less consumption of physical capital over the year), education expenditure, depletion of a nation's energy, mineral, and forest resources, and damage from CO₂ emissions.¹

These preliminary estimates show that many of the most resource-dependent countries, including all the major oil exporters, have low or negative genuine domestic savings. That means that losses

How can countries make their development more sustainable?

¹Note that these calculations do not account for such important negative factors as damage to water resources, degradation of soils, health losses from local pollution, depletion of fish stocks or such important positive factor as basic health expenditure.

Figure 16.2 Calculating the genuine saving rate



BEYOND ECONOMIC GROWTH

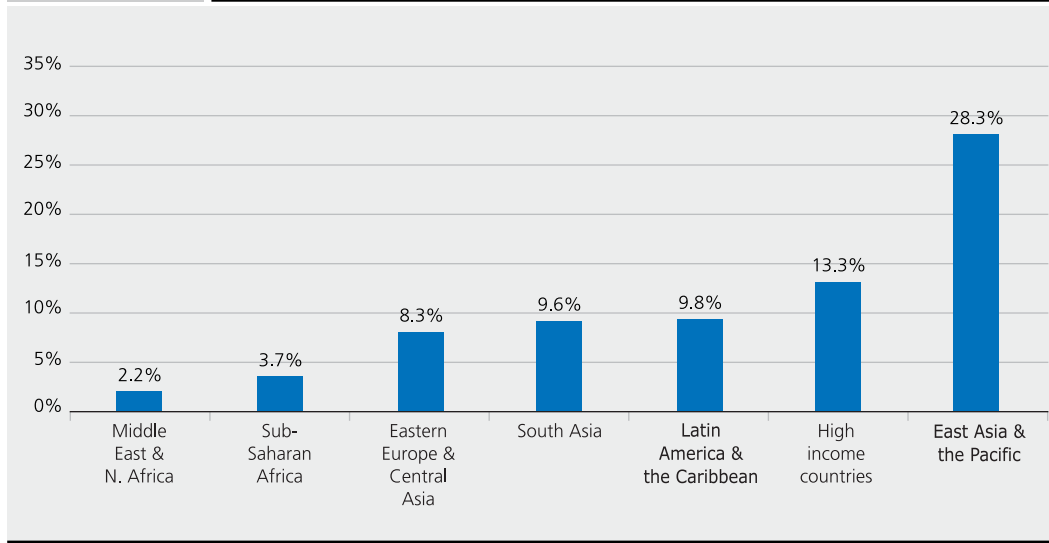
of their national wealth caused by depletion of natural capital and damage done by CO₂ emissions outweigh the benefits from net domestic saving and education expenditure. Thus it is quite possible that in these countries the aggregate national wealth was actually decreasing, to the detriment of the people's quality of life and these countries' future development prospects. And such unsustainable development might be happening in spite of positive economic growth indicators, which are usually at the center of all governments' attention.

Note that this indicator of sustainable development assumes high substitutability among different components of national wealth. It is assumed, for example, that depletion of natural resources can be compensated for by investing incomes received from these resources in education (to build up national human capital) or in new enterprises (a country's physical capital). But this can only be true to the extent that these "compensatory" investments can bring about new technologies that allow use of renewable resources instead of nonrenewable ones (for example, solar energy instead of oil) or ensure much more efficient production, using less energy and materials as inputs. One can also hope that higher income levels would increase demand for "less material" services rather than for energy- and material-intensive goods (see Chapter 9). Even so, there are certain natural resources that humanity is not likely ever to be able to replace. Think, for example, of all the **ecospheric** resources that are vital for the

maintenance of the Earth's life support systems, such as the atmospheric **ozone** that protects all biological species from harmful solar radiation. Humans as a biological species would not survive without these kinds of services from nature. There are also many natural resources that have no known practical use to people as of now, but may prove indispensable at some time in the future. That is why, for example, there exists wide agreement on the importance of preserving all the existing biological species—the irreversible losses of biological diversity can seriously compromise the choices of both current and future generations.

Clearly there are certain critical limits or thresholds beyond which different kinds of natural capital cannot be replaced by anything else. Unfortunately, in most cases scientists cannot even tell us approximately where these critical limits are. Moreover, is "survivability" really a sufficient criterion for preserving natural resources? Even if humanity could survive without the unique beauty and biological diversity of coral reefs or tropical rainforests, would we agree to deprive our grandchildren of the opportunity to see them? That is why many development experts advocate the principle of precaution in depleting any natural resources, particularly where there is a risk of serious or irreversible damage.

The limited substitutability of natural capital (as well as of many forms of human capital) underlies the limitations of the genuine domestic saving rate as an

Figure 16.3 Genuine domestic saving (investment) rate: estimates for 1998

indicator of sustainable development, even though these limitations are the flip side of the much-needed attempt to bring together all three aspects of sustainable development—economic, social, and environmental. On the one hand, this indicator can play an important role in attracting governments' attention to the issue of rational use of natural resources for the long-term benefit of their countries. It should be understood, however, that even those countries that appear to perform quite well in terms of this indicator might actually be very close to critical limits in using many of their natural resources. In Figure 16.3, based on Data Table 5, the groups of East Asian and high-income countries appear to be leading the world in the overall sustainability of their development. However, environmentalists point to the

dangerous deforestation, pollution, and loss of biodiversity that accompanied fast economic growth in East Asia. As for high-income countries, part of their relative environmental sustainability results from importing energy and mineral resources instead of depleting their own. That highlights another weakness of the indicator in question—its focus on country-level sustainability, while truly sustainable development can be only global.²

Material Throughput and Environmental Space

These indicators theoretically allow us to measure and monitor sustainability on the global scale but, unlike the genuine domestic saving rate, they focus solely on environmental sustainability.

²Note that, in spite of economic globalization, governments still bear the main responsibility for the rational use of natural resources within their national territories. Thus, country-level indicators of sustainability are important for practical policymaking, but arguably need to be supplemented by global-level indicators.

Is development possible without growth of material throughput?

Theoretically it should be possible to measure the volume of material resources flowing through the human production and consumption cycle. The total volume of this flow—called throughput—determines the total stress that humans put on their natural environment. Then the task of environmental sustainability can be seen as limiting material throughput to what nature can tolerate without serious damage to its resource-regeneration, pollution-absorption, and other important functions. The “space” within these limits is called “environmental space,” shared by all humanity. Then to determine whether a certain country is developing in an environmentally sustainable way, its use of natural resources and its pollution can be compared with the environmental space that belongs to that country.³

In fact, different countries use the limited global environmental space very unequally. High-income countries with less than one-fifth of the world population consume about three-quarters of the raw materials and energy traded in the world and are responsible for a disproportionately large share of all pollution in the world (see, for example, Fig. 14.3). Some environmentalists have calculated that if all the people on Earth were to consume natural resources in the same quantities as people in high-income countries do

today, they would need 10 planets like Earth, not one. Can it be claimed that people in the most successful economies have a legitimate right to a much bigger share of the common environmental space? Does this mean that natural environment itself precludes the possibility that the poor countries will ever catch up with the rich (see Chapter 4)?

Many development experts agree that more equitable distribution of access to global natural resources is not only morally desirable but also politically necessary to create the conditions for successful cooperation between developed and developing countries in dealing with multiple global challenges of sustainable development. But the practical—political, economic, and technological—possibility of radically reducing the use of environmental space by high-income countries is much more disputable. Such a radical change would require a strong political commitment to creating economic incentives for shifting the focus of technological development from saving labor to saving natural resources. Then economic growth in both developed and developing countries would continue with stable or even decreasing material throughput. Interestingly, some environmentalists point out that many of the technologies needed for uncoupling

³A rather similar concept of *ecological footprint* looks at the area of land that a particular group of consumers uses. This concept works reasonably well with some issues, for example, when different ways of producing food or paper are examined, but is less helpful in dealing with other issues, such as global warming (see Chapter 14) or water pollution.

economic growth from throughput growth already exist, but suboptimal economic conditions prevent their use.

Material throughput and environmental space as indicators of global environmental sustainability show that developed countries need to change their modes of production and consumption beyond those changes already under way in the course of their postindustrialization (see Chapter 9).

Social Capital and Public Officials' Corruption

Measuring and monitoring social sustainability is probably even more challenging than measuring environmental sustainability because of the lack of a widely accepted unifying concept similar to that of environmental space. Experts know how to measure many of the negative factors undermining social sustainability, such as unemployment, income inequality (see Chapter 5), or poverty (see Chapter 6). The population's education (see Chapter 7) and health status (see Chapter 8) are also understood to affect social sustainability. But any of these factors taken separately fails to explain why some countries and communities consistently tend to use all their **production resources (human, physical, and natural capital)** much more **efficiently** than do others and so are developing more successfully. The recently introduced concept of "social

capital" might be able to answer this question and "capture" most aspects of a country's social development.

Refer to Figure 16.1 once again. What this picture fails to acknowledge is perhaps the most critical factor in any society's development: the way people interact, cooperate, and resolve their conflicts. This is what conventional statistical indicators have trouble measuring. And this is what researchers have recently come to call the *social capital* of society.

Social capital refers to organizations and associations (including public, private, and nonprofit) as well as to norms and relationships (such as laws, traditions, and personal networks). It is the glue that holds societies together—what social cohesion depends on. Abundant social capital considerably lowers the costs of doing business and increases productivity by promoting trust, coordination, and cooperation at all levels. By contrast, a lack of social capital leads to conflicts and inefficiencies.

Because social capital is so multidimensional, there can hardly be a single "best" way of measuring it. But that does not mean that measurement is impossible. Researchers measure social capital in a number of creative ways, usually by calculating composite indexes based on a range of data collected through surveys. The data used for these calculations generally reflect the number of formal and

How can countries build their social capital?

BEYOND ECONOMIC GROWTH

Table 16.1 The 2000 Corruption Perception Index (selected countries)

Country rank	1	2	3	5	6	10	14	17
Country	Finland	Denmark	New Zealand, Sweden	Canada	Singapore	United Kingdom	USA	Germany
CPI score	10.0	9.8	9.4	9.2	9.1	8.7	7.8	7.6
Country rank	21	23	27	28	32	34	42	43
Country	France	Japan	Estonia	Taiwan (China)	Hungary, Tunisia	South Africa	Czech Republic	Poland, El Salvador
CPI score	6.7	6.4	5.7	5.5	5.2	5.0	4.3	4.2
Country rank	49	52	57	63	65	68	76	79
Country	Brazil	Argentina, Ghana	Latvia, Zambia	China, Egypt	Kazakhstan, Zimbabwe	Romania	Tanzania, Vietnam	Uzbekistan
CPI score	3.9	3.5	3.4	3.1	3.0	2.9	2.5	2.4
Country rank	82	85	87	89	90			
Country	Kenya, Russia	Angola, Indonesia	Azerbaijan, Ukraine	Yugoslavia	Nigeria			
CPI score	2.1	1.7	1.5	1.3	1.2			

Source: Transparency International Press Release, Berlin, September 13, 2000

informal groups and networks that people call upon, prevailing norms of cooperation and reciprocity, and people's subjective trust in others, in public and private institutions, and in governments.

Mounting evidence suggests that social capital is critical for economies to grow and for people to prosper. However, radical reforms or even rapid but unbalanced development often undermine existing forms of social capital without replacing them with new ones. Such degradation of social capital threatens social cohesion and renders development unsustainable. Some development experts believe that this is what has happened recently in many transition countries.

One red flag of social capital degradation is corruption among public servants, including bribery, misappropriation of public funds, and misuse of authority. Corruption not only wastes resources by distorting government policies away from the interests of the majority, it also generates apathy and cynicism among citizens, makes laws dysfunctional, and contributes to a rise in crime. Eventually, corruption discredits political democracy, which is essential for development, and undermines broad public support for economic reforms. It is no wonder that, according to some studies, countries suffering from high levels of corruption typically exhibit lower rates of economic growth. Such elements of social capital as

good governance and the rule of law are no less important for sustainable **economic development** than such basic economic conditions as sufficient **saving** and **investment** (see Chapter 6) or strong incentives for efficiency (see Chapter 11).

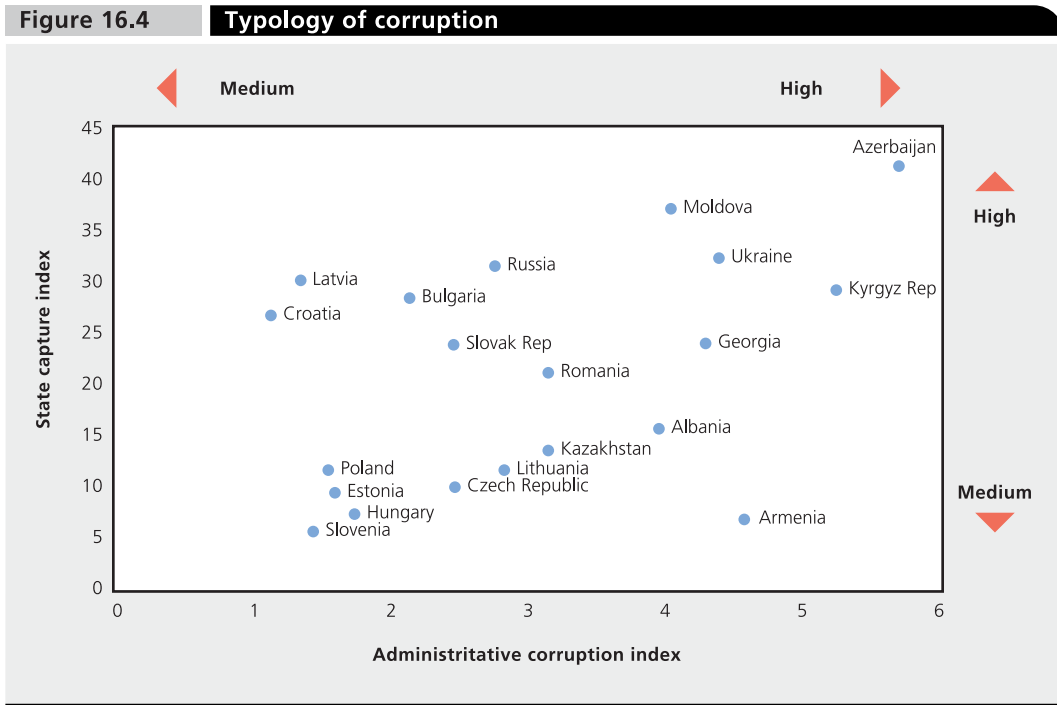
Corruption among government officials is widely seen to be particularly widespread in some African countries and in **transition countries**, where it became hard to control owing to simultaneous political and economic reforms carried out amid a massive redistribution of state assets. Table 16.1 shows selected Corruption Perception Indexes (CPI), calculated by an influential nongovernmental organization (NGO), Transparency International, based on the results of multiple surveys among businesspeople, international analysts, and the general public. These indexes range between 10 (highly clean from corruption) and 0 (highly corrupt). The 2000 CPI table ranked 90 countries for which data were available, from Finland (most clean) to Nigeria (most corrupt).

Note that the nature of corruption can differ significantly among countries. One of the ways of classifying various corrupt behaviors is based on how deep the corrupt transaction reaches into the operations of the state. So-called *administrative corruption* refers to intentional misimplementation of existing laws, rules, and regulations by public officials to provide advantages to selected individuals, groups, or firms in exchange for illicit

and nontransparent private gains (bribes). Some of the most common examples of administrative corruption, reported in enterprise surveys, are bribe payments to obtain state licenses and permits, to deal with taxes, and to gain government contracts. Household surveys show bribery in the police force, particularly the traffic police, as well as in the health and education systems as most common. On the other hand, so-called *state capture* refers to the actions of individuals, groups, or firms to *influence the formation* of laws, rules, and regulations to their own advantage by means of illicit and nontransparent provision of private benefits to public officials. The “sales” to private interests of parliamentary votes, presidential decrees, or civil and criminal court decisions are some of the most common examples of state capture.

Researchers explain the different typology of corruption in the group of transition countries (see Fig. 16.4) by the differences in their historical legacies and economic realities. Administrative corruption is typically lower in countries with longer experience of sovereignty (within recent history) and closer links to European standards of civil service. These countries tend to benefit from relatively developed systems of public administration and better-trained public officials. As for state capture, it is explained mostly as a result of high concentration of economic power. Thus countries richly endowed with natural resources (like Azerbaijan and Russia) or

How can countries fight the curse of government corruption?



well placed to serve as transit routes for the distribution of these resources (like Latvia) are the most fertile ground for state capture. In these countries there is always a risk that dominant private or public firms will develop close ties to political leaders and succeed in furthering their own interests at the expense of the broader public interest.

To control corruption and minimize its harmful effect on a country's development, governments can use different strategies. Reforming public administration to reduce opportunities and incentives for corruption and to increase transparency and accountability in government decisionmaking is usually necessary but insufficient. Other necessary measures include strengthening the independence and efficiency of the judicial system; giving more voice to NGOs

representing various groups of the population; fostering truly independent mass media; and creating a competitive private sector, free from excessive government regulation as well as from monopolization. **Market liberalization** and de-monopolization are often seen as particularly effective means of reducing the opportunities for different forms of corruption.

* * *

Think of the other possible ways to measure and monitor the sustainability of development at local, national, and global levels. In your opinion, which issues in sustainable development appear to be the most urgent? Awareness of which indicators could help people, governments, and the international community to deal with these issues?