Main Messages

• Wealth accounts provide data and indicators that can shed light on the sustainability of asset transformation and diversification. These can be used to inform macrofiscal management and policy making.

• Applying a natural capital lens to macrofiscal analysis finds that degrading the value of renewable natural capital has been associated with lower or declining total wealth per capita. Protecting and enhancing the value of renewable natural capital is associated with better economic performance overall.

• The abundance of nonrenewable natural capital in some countries raises special challenges for the sustainability of economic growth and investment, as rents are derived from depleting—and unsustainable use of—these assets. Transformation of those assets into human and produced capital is therefore an important part of the economic diversification process and can be tracked using wealth accounts.

Introduction

Natural capital abundance can represent an opportunity to accelerate economic development. However, countries that have large natural capital shares of total wealth may also face challenges associated with turning those assets into sustainable prosperity. These include challenges from resource exhaustibility and price volatility in countries that depend on
nonrenewable natural resources, including oil, gas, and mineral wealth. Transforming depleting nonrenewable natural capital into a portfolio of assets has proven difficult (Venables 2016). Renewable natural assets such as forests and fisheries are also prone to management challenges, where overconsumption can deplete their value—a phenomenon sometimes linked to the tragedy of the commons.

Long-run economic growth and sustainable prosperity depend on several important ingredients. According to the Commission on Growth and Development (2008), high-growth countries recorded high levels of investment and capital accumulation, relative to lower-growth countries. Furthermore, where a country is depleting its nonrenewable natural capital, a sufficiently high share of the revenues generated should be reinvested to accumulate other assets—such as productive capital and human capital—to offset the asset value reduction from depletion. This principle is known as Hartwick’s rule (Hartwick 1977).

Lower-income countries often have scarce human and productive capital (Collier et al. 2010). Therefore, natural capital offers an opportunity to generate additional revenue that the government or the private sector can invest in capital accumulation. But this depends on the transformation of natural assets into a more diverse portfolio of other assets. Countries face a choice about how to diversify their economies away from dependence on natural resources.

Diversification can be performed in different ways. A standard policy recommendation is for lower-income countries to boost the manufacturing export sectors, diversifying along the lines of the Asian Tigers and other rapidly industrializing economies. Studies like Hesse (2009) find a positive correlation between export diversification and welfare. Loungani (2017) indicates that increasing the tradability of services could help with diversification strategies in resource-rich countries and countries with a high concentration in manufacturing exports.

Diversification into other exports may be challenging for resource-rich economies. Ross (2019) finds that the historical diversification record among oil-exporting countries is abysmal. Between the 1990s and the mid-2010s, only 8 of 50 oil-rich countries ended the period more diverse—in export diversification terms—than they began it. This is perhaps unsurprising given the extensive literature on the challenges of Dutch disease created by an appreciating real exchange rate, making traded sectors less competitive in the face of resource booms (Corden and Neary 1982). Empirical evidence supports this theory that resource abundance depresses other exports (Harding and Venables 2016). Such a challenge would apply to exportable services (which are traded) as much as to traditional export manufacturing or commercial agriculture.

Rather than targeting export diversification, diversification of assets or wealth may prove more feasible for resource-rich countries. Since government attempts to promote export diversification have proven challenging for countries abundant in natural capital, alternative proposals have been made. Baunsgaard et al. (2012) and Peszko et al. (2020) suggest, for example, that the design of spending policies in countries with a large...
endowment of nonrenewable natural capital should build human capital and renewable natural capital and reduce infrastructure gaps. In other words, this is diversification of assets or components of a nation’s wealth (Gill et al. 2014).

This chapter provides a macroeconomic analysis of economic diversification progress. It then examines the role for a wealth accounting lens in the application of macrofiscal policy making and how that can aid governments targeting sustainable, broad-based development.

To contrast the evolution of these variables between countries with distinct levels of income and capital endowments, the chapter centers the analysis around 25 countries divided into four groups: (1) case study countries, (2) comparators with similar gross domestic product (GDP) per capita, (3) comparators with higher GDP per capita, and (4) countries with declining or stagnant wealth per capita. Figure 11.1 shows total wealth in 1995 and 2018 for the 25 selected countries. The criteria used to select these countries are described in detail in annex 11A at the end of this chapter. The analysis focuses on data between 1995 and 2018 to
match the time frame of The Changing Wealth of Nations (CWON) core accounts data, with an emphasis on the 2000–2015 supercycle. The chapter defines the commodity boom periods based on the following periods: (1) the preboom period (2000–2003, when the price of oil was on average US$40 per barrel), (2) the boom period (starting in 2004, when the price of oil rapidly increased by more than 60 percent in less than a year, and ending in 2014, when the price of oil dropped by more than 50 percent in a year), and (3) the postboom period (2015–18, when the average price of oil was below US$60 per barrel).

This chapter is divided into five sections: (1) asset portfolio diversification versus export diversification, (2) sustainability and renewable natural capital, (3) adjusted net savings as a measure of sustainable wealth conversion, (4) macroeconomic and fiscal management, and (5) institutional capital. The first section starts by contrasting export diversification policies with economic diversification, arguing that a well-balanced asset portfolio could lead to more sustainable growth. Then it explores how asset portfolio diversification can be achieved, including investments in human and physical capital, reduction of dependence on fossil fuels, and reduction of the share of natural capital in total wealth. Investing in other assets, however, does not imply a reduction of natural capital per capita. Therefore, the second section describes the risks of increasing other assets at the expense of natural capital per capita and discusses weak and strong sustainability pathways. The section ends by raising the importance of renewable natural capital and the risks derived from its decline. Because savings are crucial when investing in other assets, the third section starts by explaining how wealth can be transformed into savings that will strengthen public finances and increase resilience during economic shocks. It then warns about the risks related to dependence on nonrenewable natural resource rents and the effect of excess depletion on net savings. These savings are transformed into public assets; therefore, the fourth section analyzes the performance of public finances, contrasting countries with different wealth endowments. It then evaluates the impact of the commodity boom in selected countries’ government expenditure and fiscal balances. Because the process of accumulating capital or savings and meeting macroeconomic growth targets requires several years to substantialize, the fifth section examines the importance of good quality institutions and the benefits of early investments in institutional capital to contribute to sustained prosperity.

**Asset Portfolio Diversification versus Export Diversification**

Export diversification is a goal of many low- and middle-income countries. It has been a core driver of rapid economic growth and poverty reduction across East Asia in recent decades. This remains true for resource-abundant countries, which often seek to leverage their resource base as a platform for export diversification such as via cheap, subsidized energy or other kinds of resource-led industrial policy. Recent work (Ross 2019) finds, however, that export diversification can be very difficult to achieve.
The record among oil exporters is particularly poor. This comes as little surprise given the challenges to competitiveness posed by resource booms, which drive real exchange rate appreciation, a phenomenon known as Dutch disease (Corden and Neary 1982).

Some resource-rich countries that have achieved periods of sustained growth, however, have done so while securing a broader form of economic diversification by increasing their stocks of natural, human, and physical capital. Gill et al. (2014), for example, support this approach by showing that asset diversification should be accompanied by building better economic institutions to stabilize public finances, reduce volatility, invest in education and infrastructure, and encourage productivity. Successful developing countries have managed to transform their resource rents into human and physical assets that will help them achieve a more sustainable future. As Gill et al. (2014) conclude, countries should diversify “naturally.” The CWON provides measures to help determine the composition of nations’ total wealth and how it has changed over time.

A successful policy for sustainable economic growth might target asset portfolio diversification over export diversification by reducing the share of natural capital in total wealth. This does not mean a decline in the dollar value of natural capital per capita; instead, it emphasizes increased investments in the expansion of human capital and other productive assets. Such investments can be financed from the proceeds of prudent resource management. Lederman and Maloney (2012, 13) argue that countries should focus not on growth- or diversification-promoting sectors but on policies that “raise the overall ability of a country to increase productivity and quality, and to move to more sophisticated tasks.”

Peszko et al. (2020) explore asset diversification as a strategy that fossil fuel–dependent countries can pursue to manage the risks of low-carbon transition. They find that decarbonization policies initiated by fuel importers can unleash macroeconomic forces that encourage traditional export diversification of fuel exporters, by which they reduce reliance on export revenues from fossil fuel commodities and diversify into down-stream, emission-intensive fossil fuel value chains. Such diversification represents a comfort zone for fossil fuel exporters, but it increases their exposure to multiple channels of low-carbon transition impacts, such as border carbon adjustments, disruptive technologies, and shifts in the preferences of consumers and investors. Asset diversification can be a long-term, sustainable alternative, but it is a challenging proposition because it requires discovery of new sources of comparative advantage and accumulation of unfamiliar produced assets and human capital, including new skills and capabilities (see also Ollero et al. 2019).

On average, countries with higher levels of income have a smaller share of natural capital in total wealth. Also on average, lower-income countries have a larger proportion of natural capital than any other asset. Since 2000, the average share of natural capital in total wealth has been at least two times larger in low-income countries than in high-income countries. Meanwhile, the average share of human capital in total wealth in high-income countries is now almost two times the share in low-income countries.
Economic development has been associated with declining shares of natural capital relative to other categories of wealth. Low-income countries, including the Democratic Republic of Congo, have an asset portfolio that is highly concentrated in natural capital, representing almost half the country’s total wealth. Countries with higher GDP growth over the past two decades saw a faster decline in the share of natural capital, as other wealth accumulated. For example, Malaysia reduced its proportion of natural capital from one-fourth in 1995 to one-tenth of its total wealth in 2018, while its economy grew on average more than 5 percent each year. However, as shown in figure 11.2, there are also cases where low-income and lower-middle-income countries, including Bangladesh and Burundi, have a relatively small share of natural capital and a larger share of human capital. Asset endowments are different in these countries, and a reduction of the share of natural capital should not be the objective. Instead, the aim should be to increase the share of produced and human capital in total wealth, while also raising the value of natural capital in their asset portfolios. Indeed, for richer countries the absolute value (and value per capita) of natural capital tends to rise with the level of national income, even while its share in total wealth declines.

On average, countries with higher income per capita have a higher share of human capital in total wealth compared with their share of natural capital in total wealth. Between 1995 and 2018, as low- and middle-income countries grew wealthier, their share of human capital in total wealth increased. Some countries have been particularly successful in achieving this increase, but many countries are still struggling with this challenge.

**FIGURE 11.2 Total Wealth Breakdown, by Income Group and Country, 2018**

<table>
<thead>
<tr>
<th>Income Group</th>
<th>Natural capital</th>
<th>Human capital</th>
<th>Produced capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income</td>
<td>26.8</td>
<td>25.3</td>
<td>23.1</td>
</tr>
<tr>
<td>Lower-middle</td>
<td>50.2</td>
<td>21.6</td>
<td>28.6</td>
</tr>
<tr>
<td>Upper-middle</td>
<td>70.0</td>
<td>68.9</td>
<td>6.9</td>
</tr>
<tr>
<td>High-income</td>
<td>83.0</td>
<td>68.9</td>
<td>17.1</td>
</tr>
</tbody>
</table>

Source: World Bank staff calculations.
For example, Ghana’s share of human capital in total wealth was about 38 percent in 1995 and 55 percent in 2018. By contrast, Gabon’s share of human capital in total wealth dropped from 32 percent in 1995 to 26 percent in 2018. Other low-income countries, including Liberia, have increased the share of human capital in total wealth (from 29.7 percent in 1995 to 41.6 percent in 2018) at the expense of the share of natural wealth (which went from 55.4 percent in 1995 to 42.7 percent in 2018). However, its share of natural capital in total wealth is still 1 percentage point higher than the share of human capital (see figure 11.3). Bangladesh and Vietnam, which already had higher shares of human capital compared with natural capital, managed to increase their income per capita much faster than Liberia did.

There is a mixed picture among resource-rich countries in Sub-Saharan Africa. The share of human capital in total wealth has increased in the Democratic Republic of Congo, Ghana, and Nigeria while it has declined or has not changed in Cameroon, Gabon, and the Republic of Congo. Several Sub-Saharan African countries producing fossil fuels and minerals have made progress diversifying their asset portfolios by increasing their human capital share of total wealth. In the Democratic Republic

**FIGURE 11.3** Net National Income per Capita versus the Difference between the Shares of Human Capital and Natural Capital, 2018

Source: World Bank staff calculations.
Note: See table 11A.1, in annex 11A, for definitions of country name abbreviations.
of Congo, Ghana, and Nigeria, the shares of human capital in total wealth increased by more than 10 percentage points between 1995 and 2018. For example, Ghana’s share of human capital in total wealth increased from about 40 percent in 1995 to 57 percent in 2018, and in the Democratic Republic of Congo, this share increased from 30 percent to almost 50 percent during the same period. However, the share of natural capital in total wealth among other fossil fuel–producing countries, including Gabon and the Republic of Congo, has not changed, or has increased, resulting in a declining or stagnant proportion of human capital in total wealth. This is also reflected in their human capital per capita numbers. Human capital in the Democratic Republic of Congo, Ghana, and Nigeria in per capita terms did not stop growing between 1995 and 2018, and it surpassed the human capital per capita values of other higher-income countries (figure 11.4, panel a). However, as figure 11.4, panel b, shows, Gabon’s human capital per capita decreased during the same years, similar to what happened with other declining wealth per capita countries, including Burundi and Liberia.

The quality of human capital accumulated by resource-rich countries may vary depending on the type of natural resources they produce and the configuration of their productive sectors. For example, Kuralbayeva and Stefanski (2013) suggest that resource windfalls will shift labor from manufacturing to nonmanufacturing activities, with the most skilled in the

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**FIGURE 11.4 Human Capital versus GDP per Capita**

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**Source:** World Bank staff calculations.

**Note:** The lines show the trend of values in 2000, 2005, 2010, and 2015, ending in 2018 (indicated by a dot). See table 11A.1, in annex 11A, for definitions of country name abbreviations. Abbreviations not listed in table 11A.1 include CMR (Cameroon) and COG (Republic of Congo). GDP = gross domestic product.
manufacturing sector remaining there and increasing the productivity of the sector but decreasing productivity in others. Nonrenewable natural resources—such as oil—can also impact the quality of human capital. Ross (2008) found that oil production reduces the female labor force and thus reduces its political influence. This can have an impact on gender imbalance and enable more patriarchal norms and institutions. At the same time, oil production in countries with poor governance can drive a higher demand of law or business jobs rather than engineering-related jobs because the former might have better access to rents (Ebeke, Omgba, and Laajaj 2015). This labor specialization might have long-term effects in productivity and the generation of future jobs. The topic is explored in more detail in chapter 12.

**Sustainability and Renewable Natural Capital**

In the process of asset portfolio diversification, a decrease in the share of natural capital in total wealth does not mean a decrease in the value of natural capital in per capita terms. Economic development and diversification of the asset portfolio might imply a reduction in the share of natural capital in total wealth. Ghana’s share of human capital in total wealth increased, while its natural capital share decreased. However, its natural capital per capita went from US$6,000 in 1995 to a peak of US$9,000 during the 2004–14 commodity boom and dropped again to US$6,000 in 2018. Other countries reduced the natural capital share of total wealth but improved their value of natural capital per capita. For example, in Chile, the share of natural capital in total wealth dropped from 16 percent in 1995 to 11 percent in 2018, but its natural capital per capita increased from US$15,000 to US$21,000.

This process can also be seen clearly in countries that are less dependent on nonrenewable wealth. For example, the share of natural capital in total wealth in Bangladesh dropped by half, from 12 percent in 1995 to 6 percent in 2018, but natural capital per capita increased from US$1,000 in 1995 to $1,200 in 2018.

Poor overall wealth performance can be associated with declining natural capital. The situation is less optimistic in countries with declining or stagnant wealth per capita. In 16 of the 26 countries, human and produced capital per capita have increased at the expense of natural (mainly renewable) capital per capita. These countries are shown in the first bars from left to right in figure 11.5. In these countries, including Benin and Madagascar, where human and produced capital per capita have improved, renewable natural capital per capita has dropped. In six other countries, not only has renewable natural capital per capita declined, but human and produced capital per capita have declined as well.

**Strong and Weak Sustainability**

There are different ways to think about the overall sustainability of an economy. This analysis uses the terminology based on the work of Hartwick (1977) and Solow (1974), distinguishing between “weak” and “strong”
sustainability pathways. Weak sustainability refers to the process of capital exchange between human (or produced) capital and natural capital, a process in which natural capital might be exploited to generate economic output, some of which can be reinvested to help accumulate human (and produced) capital (Dasgupta 2004, 2007). This approach assumes that substitutability of physical and human capital for natural capital is relatively feasible; therefore, degradation of natural capital is not a first-order concern, so long as material well-being increases (Pezzey and Toman 2002). Strong sustainability implies that natural capital should remain constant or grow while human (or produced) capital increases over time (Davies 2013). Furthermore, strong sustainability typically is concerned with nature measured using physical indicators, rather than asset values—the CWON wealth accounts only provide insight into the latter. There is a debate between weak and strong sustainability proponents about which of these pathways maximizes the present value of future utility (Pezzey and Toman 2002), especially given major concerns about environmental tipping points, critical natural capital, irreversible loss of biodiversity, and climate change. However, the purpose of this analysis is not to contribute to this debate but to illustrate how the CWON wealth accounts can be a tool to examine different aspects of sustainability. This chapter does so by
contrasting the pathways followed by selected countries and the impacts on different categories of wealth and natural assets.

Degrading the value of renewable natural capital has been associated with lower or declining total wealth per capita. For example, countries that have seen a decline in their wealth per capita have seen increasing human capital per capita, but this is sometimes at the expense of their renewable natural capital. This has also resulted in a decline in GDP growth during the same years. For example, in Benin and Madagascar, per capita wealth declined or was stagnant over 1995–2018. In both countries, human capital was at least 20 percent higher in 2018 than in 1995, but renewable natural capital declined by more than 30 percent (figure 11.5). At the same time, in Benin and Madagascar, annual GDP growth was on average 2 and 3.8 percent, respectively, between 1995 and 2018.

Protecting and enhancing the value of renewable natural capital is associated with better economic performance overall. For example, GDP per capita in Azerbaijan and Cambodia tripled between 1995 and 2018, while per capita GDP in Benin and Madagascar increased less than 50 percent over the 23 years (figure 11.6). In Azerbaijan and Cambodia, produced and human capital more than doubled, while renewable natural capital per capita did not decline (figure 11.7). By contrast, while produced and human capital per capita increased in Benin and Madagascar, their renewable natural capital per capita dropped (figure 11.8). Similarly, in high-income countries that have invested not only in their human and produced capital but also in their renewable natural capital, including Poland and Uruguay, GDP per capita was at least two times higher in 2018 than in 1995 (figure 11.7). The GDP per capita growth in these two high-income countries helped them move from the middle-income to the high-income group of countries according to the World Bank classification.

**FIGURE 11.6 Annual Indexed GDP per Capita, Selected Countries, 1995–2018**

![Graph showing annual indexed GDP per capita for selected countries from 1995 to 2018](image)

Source: World Bank staff calculations.
FIGURE 11.7 Annual Indexed Per Capita Wealth, Selected Countries with Growing GDP per Capita, 1995–2018

a. Azerbaijan

b. Cambodia

c. Poland

d. Uruguay

Produced capital per capita
Human capital per capita
Renewable natural capital per capita

Source: World Bank staff calculations.

FIGURE 11.8 Annual Indexed Per Capita Wealth, Selected Countries with Declining or Stagnant Per Capita Wealth, 1995–2018

a. Benin

b. Madagascar

Produced capital per capita
Human capital per capita
Renewable natural capital per capita

Source: World Bank staff calculations.
Renewable natural capital per capita has also declined or stagnated in some fossil fuel–producing countries, including Gabon and Nigeria. The first section of the chapter discussed how nonrenewable resource rents and nonrenewable natural capital declined after 2014 in countries that produce fossil fuels. But in several of these countries, renewable natural capital is following the same trend. Countries that have been producing fossil fuels since 1995 have also reported a decline or slow growth in their renewable natural capital per capita between 1995 and 2018 (figure 11.9). Two Sub-Saharan African countries—Gabon and Nigeria—are examples of this decline in multiple types of wealth. Although their nonrenewable wealth (mainly from fossil fuels) increased by more than 30 percent during the 2004–14 commodity boom (in part due to newly discovered deposits and the increase in fossil fuel prices), this nonrenewable wealth dropped below preboom levels after 2015. At the same time, these countries had among the largest declines in renewable natural capital per capita. Gabon dropped from US$1,400 to US$1,200, and Nigeria dropped from US$3,000 to US$1,300 in fewer than five years. The decline of these assets in turn affected the countries’ total capital per capita, especially after 2015 (figure 11.10).

FIGURE 11.9 Change in Renewable Natural Capital per Capita in Countries Whose Share of Fossil Fuel Wealth in Total Wealth Was Greater than 5 Percent in 1995, 1995–2018

Source: World Bank staff calculations.
The decline of renewable natural capital per capita has been the main driver of the decline in per capita total wealth in half of the aforementioned Sub-Saharan African countries. Elsewhere, Tajikistan’s large decline in total wealth per capita was driven mainly by a reduction in produced capital per capita, and in countries in the Middle East and North Africa, declining wealth per capita was driven by reductions in human capital and nonrenewable natural capital per capita. However, in 7 of the 11 Sub-Saharan African countries with declining or stagnant wealth per capita, the deterioration of renewable natural capital per capita is the main cause of the decline in total wealth per capita. Six of them have the largest declines in renewable natural capital per capita, along with Belize, Guyana, and Moldova. These countries are Benin, Burundi, the Democratic Republic of Congo, Gabon, Liberia, and Madagascar (displayed in figure 11.11). In these countries, the loss of renewable natural capital reached at least 10 percent of total per capita wealth in 1995. The main causes of this decline include loss of forest assets and loss of value of croplands.

Adjusted Net Savings as a Measure of Sustainable Wealth Conversion

GDP growth is the most widely used macroeconomic indicator for adjudicating broad economic progress. However, this typically is examined without reference to the evolution and composition of the underlying economic variables, such as the asset portfolio or a nation’s wealth. Typically, a nation’s wealth is formed by assets that turn into income (net national income). One part of these assets and income is consumed and another
CHAPTER 11: WEALTH ACCOUNTING, DIVERSIFICATION, AND MACROFISCAL MANAGEMENT

FIGURE 11.11 Change in Wealth per Capita, by Asset, Selected Countries in Sub-Saharan Africa, 1995–2018

a. Benin

b. Burundi


d. Gabon

e. Liberia

f. Madagascar

Source: World Bank staff calculations.

Note: Wealth per capita = total wealth divided by total population.
part is saved. However, in developing countries, the empirical evidence suggests that the consumption of these assets, mostly natural resources in some countries, can comprise a large share of the net national income. Sometimes this consumption or depletion of assets exceeds 50 percent of net national income, deteriorating the country’s genuine savings.

According to Lange, Woden, and Carey (2018), aggregate measures of national wealth are closely linked to future well-being. A policy-relevant wealth indicator is an adjusted measure of net savings. The latest estimations of adjusted net savings (ANS) are based on the methods described in Lange, Woden, and Carey (2018), calculated as the total of a country’s gross national savings minus consumption of fixed capital, plus education expenditure, minus subsoil resources depletion (fossil fuels and minerals), minus net forest depletion, and minus carbon dioxide and particulate emissions damage. These measures are usually expressed as a percentage of gross national income (GNI), which is the sum of value added by all resident producers plus any product taxes, minus subsidies not included in the valuation of output, and plus net receipts of primary income from abroad. The World Bank has published national-level ANS since 1999.

ANS can be used as an alternative measure of sustainable wealth conversion and as an indicator of how sustainable economic growth may be. There was a positive relationship between the percentage point change in ANS as a share of GNI and the percentage point change in GDP per capita between 2000 and 2018 (figure 11.12). For example, in Armenia and Latvia, where GDP per capita increased more than 100 percent, the share of ANS in GNI increased by more than 10 percentage points. By contrast, in Belize and Jordan, where GDP per capita had a percentage growth rate below 15 percent, the change in the share of ANS in GNI was negative during the same years. Yet in several countries with abundant nonrenewable resources and GDP per capita growth above 50 percent, the share of ANS in GNI declined more than 20 percentage points (for example, Guinea and Nigeria). The decline in ANS in countries with increasing GDP per capita comes from the fact that their depleted assets have not been transformed into human and physical capital, violating Hartwick’s rule (Hartwick 1977), thus compromising the country’s sustainable economic growth. When natural resource depletion is not used to invest in other assets in the wealth portfolio, countries’ gross savings might not be enough to compensate this depletion, resulting in negative net savings.

Natural resource depletion has been the main driver of ANS decline in some lower-income countries. Comprehensive wealth accounts can be useful for shedding light on this. Recent work conducted by the World Bank has used the ANS approach to evaluate the net benefits generated from mining in Southern African countries (World Bank 2019). This report looks at the costs of mining, such as wealth depletion and pollution, as well as the benefits, including income, jobs, export revenues, and links to other sectors. This analysis allows the estimation of the “net benefits” once costs (including depletion) are subtracted from benefits, followed by the evaluation of how much of the income was being saved (that is, ANS).
Although depletion of natural wealth can generate wide benefits to the economy, accelerated depletion can also reduce the rate of ANS and impact long-term growth if it is not carefully reinvested. For example, Liberia’s ANS fell from −60 to almost −80 percent of GNI in 2018, as shown in figure 11.13. Most of this decline was driven by an increase in natural resource depletion (mainly from forest resource depletion). At the end of the 2004–14 commodity boom, GDP growth rates in Liberia fell to negative numbers.

Negative ANS resulting from increasing nonrenewable resource depletion implies insufficient conversion into other assets. Countries with large reserves of fossil fuel and/or mineral resources consume these, aiming to transform them into income that will lead to growth and development. However, these resources can be depleted in an unsustainable manner that will eventually impact countries’ long-term growth. For example, in the early 2000s, before the commodity boom, Ghana reached ANS shares of GNI above 10 percent, but as fossil fuel and mineral

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**FIGURE 11.12** Relationship between Change in ANS and Change in GDP, 2000–2018

![Graph showing relationship between change in ANS and change in GDP](image)

Source: World Bank staff calculations.

Note: The red line divides countries that improved their ANS as a percentage of GNI between 2000 and 2018 (upper) and countries that decreased it (lower). See table 11A.1, in annex 11A, for definitions of country name abbreviations. ANS = adjusted net savings; GDP = gross domestic product; GNI = gross national income.
production increased during the boom, depletion rates increased and the country’s ANS dropped below zero, particularly between 2007 and 2012 (figure 11.14, panel a). Although Ghana’s GDP reached growth rates above 8 percent, driven by the booming fossil fuel sector, after the boom ended annual growth quickly dropped below 5 percent. Similarly, the Democratic Republic of Congo, which was growing above 6 percent per annum during the commodity boom years, reached negative values of ANS percentage of GNI. And while its ANS percent of GNI recovered thanks to increasing gross savings, GDP growth rates did not go back to boom levels (figure 11.14, panel b).

Nonrenewable natural resource depletion is not the only problem. In addition to the depletion of nonrenewable resources and a decrease in gross national savings, air pollution and carbon dioxide damage are pushing the share of ANS in GNI close to zero in two of the largest economies in Sub-Saharan Africa. Over the past two decades, Nigeria’s air pollution damage and South Africa’s carbon dioxide damage have been negatively impacting ANS. Estimates suggest that this damage could be as concerning as fossil fuel and mineral resource depletion for savings sustainability. Nigeria’s fossil fuel depletion has fluctuated over the past 20 years, peaking during the first and last years of the commodity boom. After the 2014 oil price shock, depletion of fossil fuel’s percentage of GNI dropped, but air pollution damage remained constant (figure 11.15, panel a). South Africa has neither significantly increased depletion nor decreased gross savings, but damage from carbon dioxide has reached more than 5 percent of GNI (figure 11.15, panel b). This carbon dioxide damage is an estimate

Source: World Bank staff calculations.
Note: Energy depletion includes oil, gas, and coal. Gross and adjusted net savings data not available before 2005 for the Democratic Republic of Congo. GNI = gross national income.
resulting from multiplying the cost of US$20 per ton of carbon (unit damage in 1995 US$) by the number of tons of carbon emitted. Its negative impact on South Africa’s savings has prevailed over a decade, and the increasing share after 2015 is pushing net savings below zero, reaching –0.8 percent in 2019. The World Bank (2017) published a carbon tax guide to propose instruments that can help reduce this damage. The guide suggests, for example, that carbon taxes can be used as additional government
revenues to support climate-related initiatives that can increase renewable natural capital or be invested in human or physical capital.

Countries with declining or stagnant wealth per capita need to increase gross saving rates to improve the share of ANS in GNI. Other countries that depend less on nonrenewable wealth, including Benin, do not have increasing depletion rates of fossil fuels or minerals, and they may not be depleting their forests at a high rate. However, some of these countries are not showing growth in their gross savings; therefore, any increase in the consumption of fixed capital or a shock affecting their natural assets could pull their ANS shares of GNI into negative numbers. As figure 11.16 shows, Benin has consumed fixed capital and saved income at about the same rate every year, which has kept ANS share of GNI below zero in most years of the past two decades, with a slight improvement after 2016.

The Democratic Republic of Congo and Ghana are exhausting their known reserves of nonrenewable natural resources, absent major new discoveries. Nonrenewable natural resource depletion includes the consumption of oil, gas, coal, and mineral depletion. The rapid increase in depletion rates can raise concerning signs of approaching exhaustion. Over the past two decades, the Russian Federation has been reducing its nonrenewable natural resource depletion, derived from the oil price shocks of 2008 and 2014, with an increase in 2018 revealing its active oil and gas industry. Indonesia has reduced its nonrenewable natural resource depletion from almost 8 percent of GNI in 2000 to less than 3 percent in 2018 as it has transitioned toward increased production of renewable natural capital.

**FIGURE 11.16** Adjusted Net Savings Components in Benin, 1995–2019

Source: World Bank staff calculations.
Note: Energy depletion includes oil, gas, and coal. GNI = gross national income.
By contrast, the Democratic Republic of Congo and Ghana, which rely more on nonrenewable natural capital, have consistently increased their nonrenewable resource depletion percentage of GNI, from less than 2 percent in 1995 to more than 4 percent in 2018, putting their sustainable growth at risk (figure 11.17, panel a). Figure 11.17, panel b, shows that several fossil fuel–rich countries, including Nigeria and the Arab Republic of Egypt, are to the right of the 45-degree line, indicating that they have reduced the depletion of their nonrenewable natural capital, mainly driven by the drop in oil prices. But countries that deplete mineral natural capital or that are less fossil fuel dependent, including the Democratic Republic of Congo and Peru, appear on the left side of the 45-degree line, signaling increased depletion of their nonrenewable natural capital. These trends suggest that changes in fossil fuel wealth depletion might have been driven by cyclical forces, while mineral wealth depletion has been spared from them.

### Macroeconomic and Fiscal Management

According to the IMF (2018), strong balance sheets, where governments have more assets than debt and are more resilient to shocks, can reduce borrowing costs (see Hadzi-Vaskov and Ricci [2016] and Henao-Arbelaez and Sobrinho [2017] for developing countries and Gruber and Kamin [2012] for advanced economies). Strong balance sheets can also lead to shorter and shallower recessions compared with countries that have less healthy balances (Detter and Fölster 2015). Macroeconomic instruments, such as fiscal rules, can impose a long-lasting constraint on fiscal policy that...
limits budgetary targets and pressures to overspend in good times, ensuring debt sustainability (Schaechter et al. 2012). There are different types of fiscal rules, including debt rules, budget balance rules, structural budget balance rules, expenditure rules, and revenue rules. Bandaogo (2020) proposes that, during times of crisis, it is important that governments include contingencies in these fiscal rules to plan how to overcome an unexpected shock to the public finances and, during good times, build up national savings that can be drawn on during times of crisis. Fluctuations in public sector net worth are subject to public sector saving and dissaving; therefore, analyzing traditional aggregate fiscal indicators and measures of public sector saving can increase understanding of the drivers of fiscal performance. The Government Finance Statistics Manual 2014 (IMF 2014) provides helpful guidance on how to relate fiscal data to the System of National Accounts concepts and measures.

Countries with higher exposure to nonrenewable wealth per capita went into deeper deficits in their overall balances during the 2015–18 commodity bust period (figure 11.18, panel a). The overall balance, or net lending/net borrowing, is an indicator that helps to determine the extent to which governments accumulate debt. Stronger balances equipped with mechanisms to reduce the impact of fiscal risk factors could have helped

**FIGURE 11.18** Overall Balance versus Total Wealth per Capita and Change in Nonrenewable Natural Capital Rent per Capita

Sources: World Bank staff calculations; IMF 2020.

Note: In panel a, the lines show the trend in average values over 2000–2003, 2004–14, and 2015–18 (indicated by a dot). See table 11A.1, in annex 11A, for definitions of country name abbreviations.
countries to smooth the impact of recessions. Changes in commodity prices can affect government procurement spending, customs duty collection, and revenues (Pigato 2019). During the commodity boom, countries with higher nonrenewable natural capital per capita, such as Chile and Russia, had a significant increase of their natural resource rents derived from higher commodity prices. But as these rents dropped after 2015, the impact on the overall balance was more profound (figure 11.18, panel b). Meanwhile, countries with lower per capita nonrenewable natural capital rents, including Benin and Burundi, had little change or no impact on their overall balances after the boom years. Oil-producing countries, including Gabon and Russia, had relatively larger increases in nonrenewable natural capital rents, but after the boom ended, these rents per capita rapidly declined, having a negative impact on the countries’ overall balance. Debt fiscal rules can be effective in setting public debt targets by establishing floors and ceilings in terms of GDP to ensure debt sustainability (Schaechter et al. 2012). These debt rules can be combined with expenditure rules to reduce overspending during good times and save part of the windfall revenues to create fiscal buffers during bad times.

The cyclicality of commodity prices has affected the overall balance of countries with higher shares of natural capital in total wealth. The structural balance or cyclically adjusted balance is defined as the general government cyclically adjusted balance for nonstructural elements beyond the economic cycle (percentage of potential GDP). After the most recent commodity boom of 2004–14, there was a greater impact on the overall and structural balances of countries with relatively higher shares of natural capital in total capital (figure 11.19, panel a). For example, in Russia, where nonrenewable resource rents reached 17 percent of GDP in 2018, declining fossil fuel rents contributed to an increase of more than 3 percentage points in the overall deficit (figure 11.19, panel b). By contrast, economies that have a smaller share of natural capital had little impact on their overall balances. For example, in Turkey, where non-renewable resource rents accounted for less than 2 percent of GDP in 2018, the overall balance increased through the commodity boom period. Comparing these overall balances with the corresponding structural balances in different countries, contrasting patterns are observed (figure 11.19, panel b). For example, the percentage point change between the preboom (2000–2003) and postboom (2015–18) periods in the structural balance was similar to the change in the overall balance in countries with a higher share of natural capital. But in countries with a smaller share of natural capital, the gap between these two balances was wider. Countries with important shares of natural capital can explore the application of structural budget balance rules to enable targets that will limit increasing deficits in terms of GDP.

The commodity boom increased debt service in several countries with higher fossil fuel wealth per capita. The primary balance is defined as primary net lending (or primary net borrowing) plus net interest payable or net interest paid (interest expense minus interest revenue). In other words, the primary balance is the overall balance net of interest payments on
general government liabilities. Derived from the economic prosperity of the commodity boom, oil-producing countries, including Gabon and Nigeria, increased borrowing to support their lucrative oil sector. However, when the commodity boom ended and oil prices dropped, countries that depended on these oil rents experienced an impact on their public finances. This negative impact also had consequences for the net interest on that debt, increasing the deficit of the primary balance in countries including Russia and South Africa (figure 11.20, panel a). The gap between the percentage point change in the overall balance and the primary balance before and after the 2004–14 boom widened in oil-producing countries. Gabon and Nigeria were among the countries with the largest decreases in their overall balance. Not only did they have some of the largest declines in the primary balance among selected countries, but their primary balances declined by more than 2 percentage points of GDP compared with their overall balances (figure 11.20, panel b). By contrast, other countries that relied less on nonrenewable resource rents, including Bangladesh and Vietnam, had a smaller impact on their primary balances. Budget fiscal rules are useful for ensuring debt sustainability in the primary balance. Since interest payments are not directly under the control of policy makers, a budget fiscal rule can limit additional expenditure that could increase the deficit in countries that receive more rents from fossil fuel wealth and are exposed to price fluctuations.
Public investment can be a catalyst for growth, but public capital stock per capita is low in several countries in the Sub-Saharan Africa, Latin America and the Caribbean, South Asia, and East Asia and Pacific regions. Public investment in capital stock is an input to produce physical assets of a country, including economic infrastructure and social infrastructure. Investments in roads, airports, public schools, and hospitals are examples of public capital stock, and they can contribute to higher productivity growth and living standards (IMF 2017b). However, as shown in map 11.1, the distribution of public capital stock is unequal, and there is an important divide between high-income countries and the rest of the world. Most high-income countries, particularly in the North America and Europe and Central Asia regions, have accumulated more than US$10,000 in public capital stock per person. By contrast, most countries in the rest of the world, principally in Sub-Saharan Africa, hold less than US$4,000 in public capital stock per capita. To reduce this gap, lower-income countries would need to increase their public capital stock with higher investment rates. According to the Investment and Capital Stock Dataset (IMF 2017a), increases in public capital stock are positively correlated with increases in GDP, meaning that investments in public capital stock are an input for economic growth (figure 11.21).
MAP 11.1 Public Capital Stock per Capita, 2011

Source: IMF 2017b.

FIGURE 11.21 Long-Term Real GDP Growth versus Public Capital Growth, 1960–2015

Source: IMF 2017b.

Note: Dots represent countries. Growth rates are calculated in logs and derived as an annual average.
Countries with declining wealth per capita had a larger drop in public capital stock as a share of GDP, but an increase in private capital stock helped them maintain growth. According to the Investment and Capital Stock Dataset (IMF 2017a), most of the selected countries for this analysis had a decline in their public capital stock as a share of GDP (figure 11.22). However, countries with declining wealth per capita, like Benin, Gabon, and Liberia, had the most profound declines of this public capital stock, with a drop of more than 50 percentage points of GDP. At the same time, several countries had a decline in their private capital stock, but welcoming private investment policies helped some countries increase capital stock, including Chile, Mexico, and South Africa. Countries with declining wealth per capita that were also facing declines in public capital stock and private capital stock were more vulnerable to economic shocks. For example, Burundi, Gabon, and Liberia, countries with declining wealth per capita, saw a decline in their public and private capital stock between 2000 and 2015; after the commodity boom, they experienced negative or close to zero rates of GDP growth. By contrast, in Benin and Madagascar, also countries with declining wealth per capita, public capital stock declined but private capital stock increased during the same years. These two countries reached GDP growth rates above 4 percent in years after the commodity boom (4.9 and 6.9 percent in 2019, respectively). Therefore, investment in capital stock, public or private, could be an essential ingredient to enhance resilience after economic shocks, particularly in some countries with declining wealth per capita.

**FIGURE 11.22 General Government and Private Capital Stock versus Total Wealth per Capita**

![Graph showing the relationship between total wealth per capita and capital stocks for different countries.](image)

*Source: World Bank staff calculations using data from IMF 2017a.*

Institutional Capital

As economic diversification can be a slow process over several years, institutions become an input that can help economic policies persist over time. Resource-dependent developing countries may need even more time and can use good quality economic institutions to help them stabilize their public finances over economic cycles and guarantee that the rents from natural resources are transformed into benefits for the population. Gill et al. (2014) argue that the difference between successful developing economies and underperforming economies resides in the quality of institutions. The quality of institutions can be conceived as a characteristic of an asset, rather than an asset itself, and therefore it is not measured as part of the wealth accounts in the CWON. Chapter 15 provides a deeper discussion of this topic, covered under the broader consideration of social capital.

Transparency, property rights, rule-based governance, and regulatory environment perceptions have decreased in countries with declining wealth per capita, including Benin, Burundi, and Madagascar. One way to measure the quality of institutions is to use the dimensions of the Country Policy and Institutional Assessment scores, which capture the perception of the quality of institutions in 39 International Development Association—eligible countries (World Bank 2021). To assess the evolution of institutional capital in selected countries with different wealth per capita stock and flow, six subcomponents of this score are compared between 2005 and 2018: (1) transparency, accountability, and corruption in the public sector; (2) quality of public administration; (3) quality of budgetary and financial management; (4) property rights and rule-based governance; (5) equity of public resource use; and (6) business regulatory environment. Ratings range from 1 to 6, with higher numbers denoting better institutional performance.

There are several factors that can affect the quality of institutions, and they may depend on a country’s natural resource endowment or its type of political system. Boschini, Pettersson, and Roine (2007) argue that the negative effects of bad quality institutions are larger in countries where natural resources can be more appropriable. Therefore, better institutional quality is needed in countries with natural resources that can easily be stored or transported—such as diamonds and precious minerals—than in countries where natural resources are technically or institutionally less appropriable—such as agricultural products. On the other hand, Andersen and Aslaksen (2008) found that the resource curse is more prevalent in presidential countries compared to countries run by parliaments, regardless of their democratic or autocratic classification. In line with this, a World Bank report (de la Brière et al. 2017) indicates that parliamentary systems can improve accountability and enable the creation of a legal framework to efficiently manage natural resource wealth by monitoring wealth allocation and ensuring public voices are heard.

Overall, there has been improvement in the equity of public resource use rating in all countries; however, other measures of the quality of
institutions have deteriorated. Countries with declining wealth per capita—Benin and Madagascar—saw a sharp reduction in their business regulatory environment from 2005 (figure 11.23, panel a) to 2018 (figure 11.23, panel b). Declines in the transparency, accountability, and corruption in the public sector ratings are another trend seen in these countries, where Burundi had the steepest decline. But in other countries where wealth per capita increased, these perceptions have improved. The rating for property rights and rule-based governance in declining wealth per capita countries was one of the highest among the comparators at the beginning of the commodity boom (figure 11.23, panel a), but after 13 years, it dropped to scores below their nondeclining wealth per capita comparators (figure 11.23, panel b). However, there have been some exceptions. The Democratic Republic of Congo is a country with declining wealth per capita, but its regulatory environment and transparency score did not drop, while the equity of public resource use substantially improved. Other countries including Ghana had a more favorable outcome. This West African country improved its rule-based governance rating above that of other countries, although the score for its regulatory environment dropped below the scores of other country comparators.

Countries with higher and rising wealth per capita are associated with better institutional quality. As displayed in figure 11.24, panel a and panel b, Chile and Malaysia, the two countries with the highest total wealth per capita among the selected countries, also have had the highest
Worldwide Governance Indicator (WGI) scores compared to the rest. At the same time, in Ghana, where human capital per capita increased, the institutional quality score dimensions did not deteriorate. Indonesia is another example—it had one of the fastest increases in wealth per capita between 1995 and 2018 and the WGI scores improved. In Burundi and the Democratic Republic of Congo, where wealth per capita has been declining over the past 20 years, the WGI scores have been negative. However, there are cases of other countries with declining or stagnant wealth per capita, including Liberia, where, despite the drop in wealth, the scores improved. Another example is Gabon, where wealth per capita has been declining but the WGI scores have not deteriorated and even improved during the same years. In both cases, the strengthening of institutional quality might positively impact the long-term growth in wealth per capita.

On average, countries with higher total wealth per capita have better government effectiveness and regulatory quality scores. Government effectiveness measures the perception of the quality of public services, the degree of the government’s independence from political pressures, and the quality of policy formulation and implementation. The regulatory quality score captures the perception of the government’s ability to create clear policies and regulations that allow and promote the private sector’s participation (Kaufmann, Kraay, and Mastruzzi 2010). Countries with higher wealth per capita among the selected countries, including Chile and Malaysia, have the highest values of these scores, while Burundi and the Democratic Republic of Congo, which have smaller per capita wealth,
have negative scores (figure 11.25). In Indonesia and in Russia, total wealth per capita has been increasing since 1995, and the perceptions of government effectiveness and regulatory quality have also improved. But in other countries, like Egypt and Brazil, although total wealth per capita has increased, perceptions of government effectiveness or regulatory quality still dropped. In other cases, even with increasing government effectiveness scores, regulatory scores are not improving, regardless of the level of wealth per capita. For example, while Russia increased its government effectiveness score, its regulatory quality score declined after the 2004–14 boom period. Therefore, it may not be sufficient for some countries to increase their wealth per capita to help them improve the perceptions of the quality of their government; they may need to spend some of the increase in wealth on their institutions.

The commodity boom helped several countries increase their wealth per capita, but this increase did not translate into better governance in all categories. The rule of law score measures the perception of the degree of contract enforcement, protection of property rights, quality of the police and courts, and likelihood of crime and violence. The political stability score captures the perception of the likelihood of political instability and/or politically motivated violence, including terrorism (Kaufmann, Kraay, and Mastruzzi 2010). The good times of wealth abundance during the commodity boom helped some natural resource–abundant economies keep or improve the perception of political stability and rule of law.
An example is Indonesia, where wealth per capita did not stop growing between 1995 and 2018 and perceptions of rule of law and political stability also rapidly improved. But in other nonrenewable resource-dependent countries, including the Democratic Republic of Congo and Ghana, there has been little improvement in these perceptions (figure 11.26). Furthermore, in Egypt, Brazil, and Chile, where wealth has a large nonrenewable natural resource component, perceptions of the rule of law and stability deteriorated over these two decades. For countries with declining wealth per capita, excluding a few exceptions, the commodity boom was less favorable. In these countries, wealth per capita decreased, followed by a deterioration in the perception of the rule of law and political stability according to the WGI. Therefore, an increase in wealth per capita might be an ingredient to help maintain peace, but other factors might also be necessary.

**Conclusion**

Natural resources are a vitally important aspect of the wealth of all countries and a significant share of lower-income countries’ total wealth. However, countries with nonrenewable natural resources have faced challenges in achieving diversification and sustainable development. Some countries have performed poorly in terms of achieving export diversification, but others have had success diversifying their asset portfolio.
Those experiences may prove helpful to policymakers in countries that still face very large shares of nonrenewable natural capital in their total wealth. On average, countries that have achieved higher economic growth have also seen rapid accumulation of human capital.

However, countries need to manage their natural capital portfolio rather than simply deplete or degrade it in the diversification process. Higher-income countries and those with rising wealth per capita have achieved this alongside rising natural capital values per capita. Protecting and enhancing renewable natural capital while investing in other assets could help countries achieve a more sustainable growth path.

Several countries have struggled to use their natural resource wealth to strengthen their public finances. Nonrenewable natural resources, and the associated commodity price volatility, have proven challenging for resource-dependent countries. Therefore, it is important to design mechanisms that enable countercyclical contingencies and consider rents and resource depletion in macrofiscal management. Indicators such as ANS can serve as early warning signals of unsustainable asset accumulation and natural capital depletion. Effective natural resource management also depends on strong institutions that can secure savings in good times and stabilize the economy during bad times. This institutional capital if protected and strengthened could be the ingredient that will guarantee sustained prosperity.

Annex 11A: Country Selection and Benchmarking

To compare the macroeconomic performance and evolution of wealth in different economies with distinct levels of income and capital endowments, this chapter centers the analysis on 25 countries divided into four groups: case study countries, countries with similar GDP per capita, countries with higher GDP per capita, and countries with declining or stagnant wealth per capita (table 11A.1). The first group corresponds to a selection of five countries with a large population and natural capital equivalent to at least 10 percent of the member’s total wealth: Brazil, the Democratic Republic of Congo, Ghana, Indonesia, and the Russian Federation. These are referred to as “case study countries” and used as reference in several parts of the analysis. The second group of countries with GDP per capita similar to the case study countries includes Colombia and Peru in the Latin America and the Caribbean region, Nigeria and Kenya in the Sub-Saharan Africa region, Pakistan and Bangladesh in the South Asia region, the Arab Republic of Egypt and Morocco in the Middle East and North Africa region, and Thailand and Vietnam in the East Asia and Pacific region. The selection of countries was based on the following criteria: (1) being a lower-middle-income or upper-middle-income country, (2) having a population of more than 10 million people, (3) having had GDP per capita between US$1,000 and US$10,000 in 2018, and (4) having had average natural resource rents greater than zero between 1995 and 2018. The third group of higher GDP per capita comparators includes Chile and Mexico in the Latin America and the Caribbean region, South Africa in
the Sub-Saharan Africa region, Malaysia in the East Asia and Pacific region, and Turkey in the Europe and Central Asia region. The selection of the countries in this group follows the similar GDP per capita comparators criteria except that GDP per capita in countries of this group exceeds US$10,000. The fourth group of countries with declining or stagnant wealth per capita includes Burundi, Benin, Gabon, Liberia, and Madagascar. These five countries were selected from the list of 26 countries that did not significantly improve or experienced a decline of their wealth per capita between 1995 and 2018 and had declining renewable natural capital per capita (figure 11A.1).

### Total Wealth per Capita Growth Is Correlated with GDP per Capita Growth

Between 1995 and 2018, total wealth per capita and GDP per capita increased in the same proportion. On average, a 1 percentage point increase in total wealth per capita from 1995 to 2018 was associated with a 1.07 percentage point increase in GDP per capita (constant 2010 US$) during the same period, at 95 percent confidence level using the sample of 142 countries with no missing data for GDP and total wealth per capita (table 11A.2):

\[
\Delta GDP_{p cap, 1995-2018} = \beta_0 + \Delta Wealth_{p cap, 1995-2018} + \epsilon, \quad (11A.1)
\]

where \(\Delta GDP_{p cap, 1995-2018}\) corresponds to the percentage change in GDP per capita from 1995 to 2018 and \(\Delta Wealth_{p cap, 1995-2018}\) corresponds to the percentage change in total wealth per capita for the same years.
Therefore, the countries with the highest increase in total wealth per capita are also the countries that on average had the highest increase in GDP per capita over these 23 years. Cambodia and Lithuania are examples of this growth, where wealth and GDP per capita have increased more than 150 percent (figure 11A.2).
Notes

1. The Commission on Growth and Development notes that high-growth countries have tended to invest 5–7 percent of gross domestic product per year, versus 3 percent in lower-growth countries (Commission on Growth and Development 2008).

2. Ross (2019) also finds that measuring export diversification in oil exporters could be misleading, because changes in an oil exporter’s diversification index can be driven by changes in oil prices. For example, when oil prices rise, the fraction of an oil-rich country’s oil exports rises, causing the country’s nominal export diversity to fall.

3. An alternative to measuring the quality of institutions beyond the country coverage of the Country Policy and Institutional Assessment scores is the WGI. These indicators provide a measure of governance based on surveys and
information from experts in the public and private sectors, including nongovernmental organizations. The indicators include six dimensions: (1) voice and accountability, (2) regulatory quality, (3) political stability and absence of violence, (4) rule of law, (5) government effectiveness, and (6) control of corruption. For selected countries, these six dimensions are compared with their benchmarks. Over the past 20 years, there are contrasting outcomes for countries with different wealth endowments.

References


