Natural Development

From the Amazon rubber boom to the current oil-dependent economies, economic history provides many cautionary tales about the hazards of relying on a single commodity or a narrow set of economic activities. The transformation of Nokia from a resource sector enterprise to a telecom giant in Finland has been used as an example of the miracles that activist industrial policies can bring about. Nokia’s decline may now be used to warn policy makers in resource-dependent economies about the dangers of not being diversified.
Actually, as this report shows, Nokia and Finland provide a completely different lesson. The real lesson is that even countries with undiversified production profiles—those that depend on a few subsectors—can become ever more productive, be prolific at creating jobs, and have stable economies. They can do this by diversifying their asset portfolios. Countries with undiversified economies will prosper if instead of being distracted by attempts to subsidize non-resource-related activities their governments fulfill their core mandate: providing public services that make people more productive, creating an investment climate that encourages employment growth, and managing resource rents to reduce volatility.

Look at what has happened to Nokia and Finland. Between 1998 and 2007, Nokia contributed a quarter of Finnish economic growth. In 2000, it accounted for almost 30 percent of the country’s exports. By 2011, its revenues represented 20 percent of Finland’s gross domestic product (GDP). In the decade to 2007, Nokia sometimes paid close to 25 percent of Finland’s corporation tax collections. Nokia used many subcontractors, so these numbers should be seen as lower bound estimates of Nokia’s importance in the Finnish economy since they do not incorporate what economists call “multiplier effects.”

Then came the tumble. Just as lower-cost rubber from Asian plantations in the early 20th century ended the Amazon’s rubber boom, the release of the iPhone by Apple in 2007 precipitated the end of Nokia’s good run. Its share price fell by more than half between 2007 and 2008 (and is now worth around one-tenth of its 2007 peak). The company has struggled to compete in a growing global market of smartphones, and its share in that market fell from 50 percent to 3 percent by end-2012 (figure S3.1). In 2013 it might have sold fewer mobile phones than Samsung even in Finland.

Financial markets were quick to see what Apple and Samsung could do to Nokia, but as of 2013 it may be too early to assess the effects of Nokia’s problems on the Finnish economy. Markets, though, do not seem to weigh Nokia’s struggles heavily when evaluating Finland’s future—at least in bond yields: the spread between Finnish and German 10-year bond yields—a common indicator of credit risk and future economic performance—has remained close to zero, despite the Euro Area’s great uncertainties.

Markets seem to look past the problems of Finland’s “single superstar” in assessing its collective economic strengths and weaknesses. Their views reflect confidence in the country’s ability to manage GDP volatility, make Finnish workers more productive, and create jobs that can sustain high standards of living. There is even some evidence that the public policies to spur innovation (which were speeded up rather than slowed down by Nokia’s problems) may be paying off in the form of scores of knowledge-based start-ups (Economist 2013).
Figure S3.1. Nokia’s fortunes and Finland’s prospects

- Nokia’s share price (Jan. 2006 = 1.0) (left axis)
- Spreads of Finnish vs. German 10-year bond yields (left axis)
- Nokia’s smartphone global market share (right axis)

Sources: World Bank staff based on data from Fidelity, ECB, and Statista.

On the social side, even though Finland’s growth has slowed, the country has avoided economic crisis and social suffering. Of course, this should not be surprising. Finland has a participatory and representative government which fosters respect for the rule of law; it has good infrastructure and excellent systems of public education and health; and it has perhaps the best business climate in the Euro Area.

Is Finland’s experience the exception or the rule? Do resource-rich countries have to end their dependence on natural resources in order to achieve desired development goals? If not, what distinguishes development success from failure? To help answer such questions, this report commissioned 12 case studies of resource-rich countries around the world (see Gogova, Luna, and Pruchnik 2013). Six of them are obvious success stories: Australia, Canada, the Netherlands, Norway, the United Arab Emirates, and the United States. Another six are emerging economies at various stages of development: Botswana, Chile, Malaysia, Nigeria, Saudi Arabia, and República Bolivariana de Venezuela. This spotlight summarizes their experience, and contrasts it with that of the six resource-rich economies in Eurasia: Azerbaijan, Kazakhstan, the Russian Federation, Turkmenistan, Ukraine, and Uzbekistan.

The short answers to the questions: Finland’s experience is not an exception. The common success factor is a balanced portfolio of economic assets—natural resources, human and physical capital, and institutions. And the failure to develop can generally be traced to premature efforts to diversify the economy from resource-based products by subsidizing activities intensive in assets that are scarce or unavailable.
Resource-rich economies: a representative sample

The experiences of the 18 countries in this spotlight are representative of resource-rich economies around the world. Separately, the countries rank between 3rd and 55th in subsoil assets per capita. Together, they account for about two-thirds of the world’s natural capital (figure S3.2).

“Sowing the oil” to diversify the economy has been a long-standing goal for many of the countries surveyed here. But only a few have managed to break free from dependence—defined either as a share of domestic production, exports, or government revenues—on their most abundant resource or resources. Most resource-rich economies—developed and developing—still rely on their natural resource wealth as an important economic sector in its own right, for export receipts, and for government revenue (figure S3.3).

Exports from the developed countries in the countries surveyed tend to be more diversified than from the other two groups, except for the United Arab Emirates, Norway, and Australia, which have higher levels of export product concentration. Norway and the United Arab Emirates actually have more concentrated exports than Chile, Kazakhstan, and RB Venezuela—countries with less than half their per capita incomes. The most diversified country is the United States. Azerbaijan, Nigeria, Saudi Arabia, and RB Venezuela are the least diversified. Their attempts to redirect economic activity away from oil have generally been unsuccessful, and oil still accounts for about 90 percent of total merchandise exports. Natural resources have dominated Eurasia’s export basket for over two decades.

**Figure S3.2. Subsoil natural resource wealth per capita, 2005**

(Constant 2005 U.S. dollars)

| Country                  | Wealth per Capita |
|--------------------------|-------------------|
| United Arab Emirates     | 118,111           |
| Norway                   | 99,706            |
| Saudi Arabia             | 86,620            |
| Turkmenistan             | 32,468            |
| Russian Federation       | 24,238            |
| Venezuela, RB            | 24,090            |
| Australia                | 20,328            |
| Kazakhstan               | 20,268            |
| Canada                   | 12,644            |
| Malaysia                 | 10,102            |
| Chile                    | 9,563             |
| Azerbaijan               | 9,194             |
| Netherlands              | 7,061             |
| Uzbekistan               | 5,365             |
| Nigeria                  | 3,940             |
| United States            | 3,478             |
| Ukraine                  | 1,970             |
| Botswana                 | 982               |

Source: World Bank 2010.

Note: The number in parentheses indicates the global rank of each country in subsoil assets per capita; the pie chart indicates aggregate subsoil resource wealth for both the sample economies and the rest of the world.
Figure S3.3. Natural resource dependence, developed and developing economies

Source: UN Statistics Division.

Note: Data for Turkmenistan and Uzbekistan are unavailable.

(continued)

Note: SITC (Standard International Trade Classification) Rev. 3, sections 27, 28, 32, 33, 34, 68. Data reflect exports of raw commodities only, and do not include manufactured goods. The share of commodity exports for Ukraine rises to 50 percent of all merchandise exports when section 67 (Iron and Steel) reported under manufactured goods is added. The number is 15 percent when using the existing aggregation of sectors.
c. Herfindahl-Hirschman Index, exports of products, Harmonized System 1988/92 6-digit, 2010

Figure S3.3. Natural resource dependence, developed and developing economies (cont.)

Source: UN Comtrade.

Note: SITC (Standard International Trade Classification) Rev. 3, sections 27, 28, 32, 33, 34, 68.

d. Resource revenue as share of total fiscal revenue, 2006–10

Source: IMF 2012.

Note: Data for United States, Netherlands, Australia, Canada, Uzbekistan, and Ukraine are unavailable.
Governments may try to spur diversification by developing sectors outside the country’s comparative advantage through industrial policies. Some of the countries analyzed here have managed to become competitive in new sectors. But their success has been most notable in sectors that are intensive in assets prominent in their asset portfolios. For example, Chile successfully exports goods that are natural-resource intensive; Malaysia has encouraged manufacturing and export of products that are highly labor intensive; and the United Arab Emirates has become a major exporter of services, emerging as the logistical, trade, and tourism hub of the Middle East. But despite their success in creating new industries, all three stay dependent on natural resources.

**Development outcomes and asset portfolios**

The 18 countries in this spotlight are heterogeneous in how much they have diversified their asset portfolios. But three groups of countries can be discerned, depending on their levels of development—mainly their per capita income levels:

- **Group I**: developed economies, represented by Australia, Canada, the Netherlands, Norway, the United Arab Emirates, and the United States
- **Group II**: successful developing economies, represented by Botswana, Chile, Kazakhstan, Malaysia, Russia, and Saudi Arabia
- **Group III**: underperforming economies, represented by Azerbaijan, Nigeria, Turkmenistan, Ukraine, Uzbekistan, and RB Venezuela.

The average per capita income in 2012 for groups I, II, and III is $39,000, $16,000, and $7,000, respectively, in purchasing power–adjusted 2005 prices. The average Human Development Indexes for the same year are 0.91, 0.76, and 0.67. Group I has good development outcomes, Group II has satisfactory outcomes, while Group III is obviously underachieving—hardly surprising, although even Group III achieves medium human development according to the Human Development Report (figure S3.4).
Their asset portfolios—the mix of natural resources, human and physical capital, and institutional quality—are shown in figure S3.5. The best available estimates of natural, built (the average of human and physical capital), and institutional capital are available from the World Bank (2013). These assets are proxied by subsoil assets per capita, average years of schooling, capital stock per capita, and institutional quality. The quality of institutions is in turn an average of four indicators: inflation volatility (which proxies the quality of institutions to ensure monetary stability and sound fiscal management—chapter 6); government effectiveness (which reflects the quality of public services); political institutions (measured by the Polity IV Project indicators, which record key qualities of executive authority and political competition—see annex S3B); and the quality of the regulatory environment (measured by the scores—not ranking—in the World Bank’s Ease of Doing Business Indicators).

Gaps between the groups—and how to close them

The countries in Group I possess the highest level of subsoil assets per capita largely because of the United Arab Emirates and Norway, but all have been able to successfully diversify their asset portfolios. In contrast, Group III has lower levels of all three types of capital. What distinguishes Group I from Group II is the much higher built capital in the former—the gap in institutional assets is not nearly as large. And what distinguishes Group II from Group III is the quality of institutions—the gap in built capital is small.
It is hard to identify policy priorities at this level of aggregation, but the suggested sequencing is that Group II economies first develop their institutions (the need for catch-up in built capital comes later). The policy priority for Group III and Group II economies is the quality of institutions, not built capital. Figure S3.5 also suggests that for resource-rich economies, the quality of institutions makes the difference between success and failure at a relatively early stage of development.

The use of oil rents for public investments in infrastructure has helped the United Arab Emirates outperform countries like Australia and Norway in infrastructure quality measured by, for example, the World Bank’s Logistics Performance Index (LPI). Human capital has increased too, putting the United Arab Emirates in the high human development category (UNDP 2013). Countries in Group II have also taken steps to transform resource rents into other assets, and their stock of human and physical capital has grown over the years. But what really differentiates them from Group III is the improvement in institutions that has helped them convert resource rents into economic assets. Botswana, Chile, and Malaysia are reaping the benefits of early efforts to diversify through improvements in income status and economic outcomes. Kazakhstan, Russia, and Saudi Arabia are following their footsteps and catching up, as the process of industrialization started later there.

The institutional capital of Chile is as high as that of developed countries and it is ranked first in Latin America and the Caribbean, according to the Ease of Doing Business Indicators. The copper-rich nation has lower levels of physical capital than other countries in the group but has made more progress in building its human capital. Chile comes first in Latin America on the highest number of years of schooling and PISA scores. Other contributing factors are the role of government in ensuring a stable macroeconomic framework, a robust set of rules for using copper-related revenues, and structural improvements.

Similar to Chile, efforts to promote exports and foreign direct investment in Malaysia were made possible by an improved rule of law, a transparent legal framework, and business-friendly regulations, which discouraged rent-seeking and provided a relatively level playing field for domestic and foreign enterprises. The mid-1980s witnessed the beginning of government programs promoting more high-tech products and skills upgrading. Policies included liberalizing skilled immigration, a dramatic expansion in enrollment in polytechnics, exchange relations with universities in Australia and Canada, and skills development programs jointly sponsored by governmental and educational institutions (Gelb 2010).

Unlike Malaysia and Chile, Botswana is a sparse, landlocked country. Still, it does well in many dimensions of economic management and governance, and has managed its diamond wealth capably. These gains are evident in improved education and health, and in four decades of sustained economic growth. Botswana did not start with favorable conditions in 1966 after gaining independence from the United Kingdom: it had only about 40 university graduates and 100 people with secondary education (Harvey and Lewis 1990). Today, the country has more than 16,000 students in universities, and 33 percent of its population has secondary schooling.
Saudi Arabia has diversified its economic assets less than these three countries. It does well on business indicators, but the gap between de jure and de facto institutions is large. Its large infrastructure investments have increased its physical capital. However, government education programs have only limited impact, and education remains a constraint to private sector development.

Kazakhstan and Russia complete Group II. Kazakhstan scores lower than Russia in human capital, with achievements closer to those of the other Eurasian countries covered by PISA. But both fall short on institutional capital relative to the other four Group II countries, even if they do better than other Eurasian countries (figure S3.6).

Countries in the third group have not done as well. Nigeria and RB Venezuela exemplify the difficulties associated with establishing the arrangements to manage resource rents. Although Nigeria’s strengthened macroeconomic policies over the last few years are paying off, oil has been a destabilizing factor rather than a developmental asset for several decades. Since the discovery of oil in the 1970s, Nigeria has seen high output and public spending volatility in line with the boom-bust cycles of the world oil market. Yet the many years with oil money have not put an end to poverty or unemployment and have, instead, brought stagnation.

The poor economic performance of RB Venezuela during the last few decades stands in sharp contrast to its strong growth and development fueled by oil production and exports at the start of the last century. RB Venezuela’s growth has stalled since interventionist policies were launched in the 1970s and the oil sector was nationalized, culminating in collapsing oil production as well as tumbling income levels and economic indicators in the late 1970s. All this was matched by a secular decline in human, physical, and institutional capital.
It is striking that in their natural and built capital, Russia and Kazakhstan—Eurasia’s Group II economies—are not especially different from Azerbaijan, Turkmenistan, Ukraine, and Uzbekistan—Eurasia’s Group III economies. But they have done better in improving the quality of their institutions. Yet Kazakhstan and Russia still compare unfavorably with the more successful Group II economies—Botswana, Chile, Malaysia, and Saudi Arabia—in their institutional quality.

**Asset portfolios and economic performance**

To assess the level of diversification of the asset portfolio and how it affects economic performance, we constructed two indexes: an aggregate asset portfolio index and an index of economic performance. The first helps in rating the 18 economies according to their economic assets: natural resources, built capital, and national institutions. The second is an average of three measures: productivity growth, economic stability, and employment creation. Higher values of these indexes indicate more diversified assets and better outcomes.

Countries that have more diversified assets appear to have better economic outcomes (see figures S3.7 and S3.8, which plot the index of economic outcomes against that of diversification of asset portfolios). The correlation between outcomes and diversification is even stronger when institutions are given more weight. Recall from chapters 1 and 3 that the measures of economic performance show no correlation with measures of economic diversification such as export concentration. The contrast with the findings in figures S3.7 and S3.8 is striking. Diversified asset portfolios are a much better predictor of economic performance than are measures of diversified production profiles.

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**Figure S3.7. Asset portfolio diversification and economic performance**

Sources: World Bank staff estimates based on data from World Bank; IMF; Penn World Table; Barro and Lee; Worldwide Governance Indicators; and the Polity IV Project.

Note: The asset portfolio index here uses equal weights of 0.33 each for natural capital, built capital, and institutions.

a. Higher values indicate better outcomes.
b. Higher values indicate more diversified portfolio.
The performance of Group I, where growth in productivity and in employment has been on the rise, is impressive. Output volatility has smoothed out over the years, muting the effect of large export price swings. Still, their experience shows that high incomes and development do not necessarily provide insurance against the resource curse. (The Netherlands was already a developed economy when natural gas deposits were discovered, and Dutch disease hit. Despite its debilitating effects, the economy bounced back, because it had three other sources of capital beyond natural resources—human, physical, and institutional.)

Norway does well in all three measures of economic performance: it has been able to engineer output stability, high productivity levels, and impressive employment rates. It has the lowest output volatility after the United States for 2000–10, and unemployment was just 3.3 percent in 2011. Its success in harnessing oil wealth is associated with the high level of asset diversification at the time of oil discovery in 1968.

A more recent example of how to use abundant natural resources for economic performance comes from the United Arab Emirates, whose macroeconomic policies do well in shielding the economy from commodity price fluctuations. This has helped lower output volatility. Aggregate employment growth rates are also among the highest in the Gulf.

Successful asset diversification in Chile, Malaysia, and Botswana has led to relatively robust economic performance. These three have higher levels of institutional capital than the other countries in Group II. Chile’s strongest points may be macroeconomic stability and fiscal discipline in using its copper-related revenues. These policies have helped to lower output volatility and facilitate countercyclical policy interventions. Malaysia’s most impressive achievements

Sources: World Bank staff estimates based on data from World Bank; IMF; Penn World Table; Barro and Lee; Worldwide Governance Indicators; and the Polity IV Project.

Note: The asset portfolio index here uses weights of 0.5 each for total capital (natural plus built) and institutions.

a. Higher values indicate better outcomes.
b. Higher values indicate more diversified portfolio.

Figure S3.8. Asset portfolio diversification and economic performance, with institutions emphasized
have been productivity and employment growth, although output and public spending remain volatile. Botswana’s diversified asset portfolio is associated with increased living standards, improved education, and four decades of sustained growth; productivity and employment growth have been more erratic.

Despite reducing output volatility, productivity growth in Saudi Arabia has remained below the average in the Middle East. Another challenge the country faces is the need to create employment for nationals, who account for less than half the labor force. The response includes relying on an overexpansion of government employment. The Gulf countries share similar characteristics in how they segment the labor force: foreign workers occupy the larger share of the labor force, whereas nationals occupy highly paid and prestigious public sector jobs—the Gulf Syndrome. Its negative impact has been offset by the higher productivity of nonnationals. Foreign labor is highly elastic and available at competitive wages. Russia and Kazakhstan outperform most resource-rich countries as their economic outcomes have marked an improvement in all three economic outcomes.

Group III countries exhibit the difficulties associated with establishing and improving the institutions and policies required to manage resource rents, provide public services, and regulate private enterprise. Their economic outcomes remain unsatisfactory. Development in Nigeria has been hampered by voracious public spending that outpaced oil revenues in the 1980s and the 1990s. Poor institutions have led to a shrinking labor force and stagnating productivity. The story of RB Venezuela is also one of turbulent development and periodic economic collapse—since the 1970s mainly attributable to weak institutions. Uzbekistan does relatively well in resource-rich Group III Eurasian countries in economic performance—low output volatility and strong productivity growth. It surpasses all economies in its group; indeed it does better than Russia in the economic performance index (annex S3B).

**Diversifying naturally**

Governments in countries with natural resources are understandably drawn to the possibility of using them to subsidize less-volatile nonextractive activities such as high-tech manufacturing, financial services, and construction. The global experience summarized in the three spotlights in this report suggests a better (though longer-term) strategy for diversification: governments should use the rents from natural resources to invest in education and infrastructure, combined with efforts to improve the arrangements to regulate private enterprise evenhandedly. Implemented well, this approach will improve economic performance—stabilizing the economy, boosting employment, and increasing productivity. It might lead to greater economic diversification but—more important—it will bring about a more diversified development.
Annex S3A  Development outcomes

Table S3A.1 contains key development outcomes of the 18 resource-rich economies analyzed in spotlight three. The development indicators include per capita income, life expectancy, and the Human Development Index.

Table S3A.1. Development outcomes in selected economies

| Country                     | GDP per capita, PPP (constant 2005 international $) 2012 | Life expectancy at birth 2011 | HDI value 2012 |
|-----------------------------|----------------------------------------------------------|-------------------------------|----------------|
| Group I (developed economies)* | 39,368                                                   | 80.1                          | 0.91           |
| Australia                   | 35,669                                                   | 81.8                          | 0.94           |
| Canada                      | 35,936                                                   | 80.9                          | 0.91           |
| Netherlands                 | 36,599                                                   | 81.2                          | 0.92           |
| Norway                      | 47,547                                                   | 81.3                          | 0.96           |
| United Arab Emirates        | 37,392a                                                  | 76.7                          | 0.82           |
| United States               | 43,063                                                   | 78.6                          | 0.94           |
| Group II (successful developing economies)* | 15,682                                                   | 69.7                          | 0.76           |
| Botswana                    | 14,639                                                   | 53.0                          | 0.63           |
| Chile                       | 15,848                                                   | 79.0                          | 0.82           |
| Kazakhstan                  | 11,973                                                   | 68.9                          | 0.75           |
| Malaysia                    | 14,775                                                   | 74.3                          | 0.77           |
| Russian Federation          | 15,177                                                   | 69.0                          | 0.79           |
| Saudi Arabia                | 21,678b                                                  | 74.1                          | 0.78           |
| Group III (underperforming economies)* | 6,946                                                   | 66.8                          | 0.67           |
| Azerbaijan                  | 9,156                                                    | 70.7                          | 0.73           |
| Nigeria                     | 2,294                                                    | 51.9                          | 0.47           |
| Turkmenistan                | 9,121                                                    | 65.0                          | 0.70           |
| Ukraine                     | 6,394                                                    | 70.8                          | 0.74           |
| Uzbekistan                  | 3,095                                                    | 68.3                          | 0.65           |
| Venezuela, RB               | 11,613                                                   | 74.3                          | 0.75           |

Sources: World Bank; UNDP 2013.

Note: HDI = Human Development Index; PPP = purchasing power parity.

a. Group average, unweighted.

b. 2011.
Annex S3B  Indexes for outcomes and diversification

The overall diversification of assets within the economic portfolio of each country is summarized in a multiplicative index (asset portfolio index). The overall efficiency of economic performance of each country is summarized in a composite index (economic performance index). The measures used to construct the two series are listed in table S3B.1.

Table S3B.1. Measures used to construct the economic performance and asset portfolio indexes

| Asset portfolio | Measure | Year | Source |
|-----------------|---------|------|--------|
| Natural capital | Subsoil assets 2005, per capita values; constant 2005 US$ | 2005 | The Changing Wealth of Nations, World Bank |
| Human capital   | Average years of schooling of people 15+ years of age | 2000–11 | Robert Barro and Jong-Wha Lee, “A New Data Set of Educational Attainment in the World, 1950–2010” |
| Physical capital| Capital stock, per capita, thousands of constant 2005 US$ | 1995–2010 | World Economic Outlook, IMF |
| Institutional capital | Ease of Doing Business, Distance to Frontier measure | 2006–13 | Doing Business, World Bank |
| Political Institutions | Political Institutions, Polity 2 | 2005–11 | Polity IV Project, Political Regime Characteristics and Transitions, 1800–2012 |
| Government Effectiveness | Government Effectiveness, Estimate of Governance series | 1996–2011 | Worldwide Governance Indicators |
| Inflation volatility | Inflation volatility, YoY % change in CPI based on quarterly data, 4-year moving standard deviation | 2005–12 | International Financial Statistics, IMF |

| Economic performance | Measure | Year | Source |
|----------------------|---------|------|--------|
| Productivity level   | Labor productivity [=GDP/ EMPTOT], constant 2005 US$ | 1995–2010 | World Development Indicators (WDI), World Bank |
| Productivity growth  | Labor productivity [=GDP/ EMPTOT], constant 2005 US$, growth rate (%) | 1995–2010 | World Development Indicators (WDI), World Bank |
| Output volatility    | Volatility, real per capita GDP growth, %, 5-year moving standard deviation | 1995–2010 | Penn World Table Version 6.3 |
| Employment level     | Employment participation, % working-age population (ages 15+) | 1995–2010 | World Development Indicators (WDI), World Bank |
| Employment growth    | Employment participation, % working-age population (ages 15+), growth rate (%) | 1995–2010 | World Development Indicators (WDI), World Bank |

Note: CPI = consumer price index; YoY = year on year.
Table S3B.2. Asset portfolio data and index components

| Country          | Natural capital Subsoil assets per capita 2005 (1) | Human capital Average years of schooling 2000–11 (2) | Physical capital Capital stock per capita 1995–2010 (3) | Doing Business, DTF 2006–13 (4) | Polity 2 2005–11 (5) | Government effectiveness 1996–2011 (6) | Inflation volatility 2005–12 (7) |
|------------------|-----------------------------------------------|---------------------------------------------------|---------------------------------------------------|--------------------------------|------------------|-----------------------------------|------------------|
| Australia        | 20,328.50                                     | 11.97                                             | 11.15                                             | 79.69                         | 10.00            | 1.77                              | −0.68            |
| Azerbaijan       | 9,194.07                                      | 11.20                                             | 2.09                                              | 57.81                         | −7.00            | −0.81                             | −3.24            |
| Botswana         | 981.75                                        | 8.46                                              | 14.97                                             | 64.06                         | 8.00             | 0.56                              | −1.55            |
| Canada           | 12,643.73                                     | 11.63                                             | 87.30                                             | 83.64                         | 10.00            | 1.90                              | −0.58            |
| Chile            | 9,562.67                                      | 9.40                                              | 13.04                                             | 67.81                         | 9.86             | 1.19                              | −0.66            |
| Kazakhstan       | 20,267.90                                     | 10.21                                             | 14.98                                             | 57.48                         | 3.57             | −0.58                             | −1.66            |
| Malaysia         | 10,102.13                                     | 9.09                                              | 16.07                                             | 74.59                         | 4.71             | 1.05                              | −1.12            |
| Netherlands      | 7,060.97                                      | 11.23                                             | 105.86                                            | 75.39                         | 10.00            | 1.90                              | −0.40            |
| Nigeria          | 3,940.22                                      | 5.00                                              | 2.87                                              | 50.78                         | 4.00             | −1.03                             | −2.27            |
| Norway           | 99,705.80                                     | 12.50                                             | 162.38                                            | 82.11                         | 10.00            | 1.91                              | −0.66            |
| Russian Federation | 24,237.80                                  | 9.76                                              | 19.94                                             | 55.33                         | 4.57             | −0.47                             | −1.44            |
| Saudi Arabia     | 86,620.15                                     | 7.39                                              | 29.78                                             | 68.16                         | −10.00           | −0.24                             | −0.99            |
| Turkmenistan     | 32,468.38                                     | 9.90                                              | 8.24                                              | 55.33                         | −9.00            | −1.48                             | −2.81            |
| Ukraine          | 1,970.10                                      | 11.13                                             | 10.33                                             | 46.20                         | 7.00             | −0.70                             | −1.92            |
| United Arab Emirates | 118,110.73                              | 8.56                                              | 68.58                                             | 67.15                         | −8.00            | 0.80                              | −1.92            |
| United States    | 3,478.15                                      | 12.51                                             | 96.13                                             | 84.69                         | 10.00            | 1.61                              | −0.95            |
| Uzbekistan       | 5,365.13                                      | 10.00                                             | 2.09                                              | 43.05                         | −9.00            | −1.00                             | −2.29            |
| Venezuela, RB    | 24,090.45                                     | 6.89                                              | 21.04                                             | 37.10                         | 1.71             | −0.94                             | −2.29            |
## Index

| Natural capital | Built capital | Index capital | Institutions |
|-----------------|---------------|---------------|--------------|
| Subsoil assets per capita 2005 | Average years of schooling 2011 | Capital stock per capita 1995-2010 | Built capital | Doing Business, DTF 2006-13 | Polity 2 2005-11 | Government effectiveness 1996-2011 | Inflation volatility 2005-12 | Index institutions |
| (8)             | (9)           | (10)          | (11)         | (12)         | (13)          | (14)          | (15)         | (16)          | (17)         |
| 1.17            | 1.93          | 1.68          | 1.80         | 1.48         | 1.89          | 2.00         | 1.96         | 1.90         | 1.94         |
| 1.07            | 1.83          | 1.00          | 1.41         | 1.24         | 1.44          | 1.15         | 1.20         | 1.00         | 1.20         |
| 1.00            | 1.46          | 1.08          | 1.27         | 1.14         | 1.57          | 1.90         | 1.60         | 1.59         | 1.67         |
| 1.10            | 1.88          | 1.53          | 1.71         | 1.40         | 1.98          | 2.00         | 2.00         | 1.93         | 1.98         |
| 1.07            | 1.59          | 1.07          | 1.33         | 1.20         | 1.65          | 1.99         | 1.79         | 1.91         | 1.83         |
| 1.16            | 1.69          | 1.08          | 1.39         | 1.28         | 1.43          | 1.68         | 1.27         | 1.56         | 1.48         |
| 1.08            | 1.54          | 1.09          | 1.32         | 1.20         | 1.79          | 1.74         | 1.75         | 1.75         | 1.75         |
| 1.05            | 1.83          | 1.65          | 1.74         | 1.40         | 1.80          | 2.00         | 2.00         | 2.00         | 2.00         |
| 1.03            | 1.00          | 1.00          | 1.00         | 1.01         | 1.29          | 1.70         | 1.13         | 1.34         | 1.37         |
| 1.84            | 2.00          | 2.00          | 2.00         | 1.92         | 1.95          | 2.00         | 2.00         | 2.00         | 1.91         | 1.96         |
| 1.20            | 1.63          | 1.11          | 1.37         | 1.29         | 1.38          | 1.73         | 1.30         | 1.63         | 1.51         |
| 1.73            | 1.32          | 1.17          | 1.25         | 1.49         | 1.65          | 1.00         | 1.37         | 1.79         | 1.45         |
| 1.27            | 1.65          | 1.04          | 1.35         | 1.31         | ..             | 1.05         | ..          | 1.00         | ..          | 1.03         |
| 1.01            | 1.82          | 1.05          | 1.43         | 1.22         | 1.19          | 1.85         | 1.23         | 1.15         | 1.36         |
| 2.00            | 1.47          | 1.41          | 1.44         | 1.72         | 1.63          | 1.10         | 1.67         | 1.47         | 1.47         |
| 1.02            | 2.00          | 1.59          | 1.79         | 1.41         | 2.00          | 2.00         | 1.91         | 1.81         | 1.93         |
| 1.04            | 1.67          | 1.00          | 1.33         | 1.19         | 1.13          | 1.05         | 1.14         | ..          | 1.11         |
| 1.20            | 1.25          | 1.12          | 1.18         | 1.19         | 1.00          | 1.59         | 1.16         | 1.33         | 1.27         |

**Sources:** World Bank staff estimates based on data from World Bank; IMF; Barro and Lee; Worldwide Governance Indicators; and the Polity IV Project.

**Note:** The values of the indicators in the Data section of this table are rescaled using the “min-max” method. The rescaled scores are presented in the Index section of the table. They are calculated by first subtracting the minimum score and then dividing by the difference between the minimum and maximum score. The maximum rescaled score is equal to 2 and the minimum rescaled score is equal to 0 in order to avoid index values during the process of multiplication. The asset portfolio index is a multiplicative index. It has three main components: natural capital, built capital, and index institutions. The built capital component, column (11), is the unweighted average of columns (9) and (10); average years of schooling and capital stock per capita. The unweighted average of natural capital, column (8), and built capital, column (11), compose the index capital, column (12). The index institutions, column (17), is constructed as the unweighted average of the four indicators under institutions: Ease of Doing Business (distance to frontier measure), political institutions (Polity IV Project), government effectiveness (Estimate of Governance series), and inflation volatility. DTF = distance to frontier; .. = negligible.

a. Lower values indicate higher inflation volatility in the Data section.
Table S3B.3. Multiplicative asset portfolio index

a. Product of three types of economic assets: natural capital, built capital, and index institutions—columns (8), (11), and (17) in table S3B.2.

| Country          | Natural capital (1) | Built capital (2) | Index institutions (3) | Multiplicative index (4)=(1)×(2)×(3) |
|------------------|---------------------|-------------------|------------------------|--------------------------------------|
| Australia        | 1.17                | 1.80              | 1.94                   | 4.07                                 |
| Azerbaijan       | 1.07                | 1.41              | 1.20                   | 1.81                                 |
| Botswana         | 1.00                | 1.27              | 1.67                   | 2.12                                 |
| Canada           | 1.10                | 1.71              | 1.98                   | 3.71                                 |
| Chile            | 1.07                | 1.33              | 1.83                   | 2.61                                 |
| Kazakhstan       | 1.16                | 1.39              | 1.48                   | 2.39                                 |
| Malaysia         | 1.08                | 1.32              | 1.75                   | 2.49                                 |
| Netherlands      | 1.05                | 1.74              | 1.95                   | 3.57                                 |
| Nigeria          | 1.03                | 1.00              | 1.37                   | 1.40                                 |
| Norway           | 1.84                | 2.00              | 1.96                   | 7.23                                 |
| Russian Federation| 1.20               | 1.37              | 1.51                   | 2.48                                 |
| Saudi Arabia     | 1.73                | 1.25              | 1.45                   | 3.13                                 |
| Turkmenistan     | 1.27                | 1.35              | 1.03                   | 1.75                                 |
| Ukraine          | 1.01                | 1.43              | 1.36                   | 1.96                                 |
| United Arab Emirates | 2.00            | 1.44              | 1.47                   | 4.24                                 |
| United States    | 1.02                | 1.79              | 1.93                   | 3.53                                 |
| Uzbekistan       | 1.04                | 1.33              | 1.11                   | 1.53                                 |
| Venezuela, RB    | 1.20                | 1.18              | 1.27                   | 1.80                                 |

b. Product of two types of economic assets: index capital and index institutions—columns (12) and (17) in table S3B.2.

| Country          | Index capital (1) | Index institutions (2) | Multiplicative index (3)=(1)×(2) |
|------------------|-------------------|------------------------|----------------------------------|
| Australia        | 1.48              | 1.94                   | 2.88                             |
| Azerbaijan       | 1.24              | 1.20                   | 1.48                             |
| Botswana         | 1.14              | 1.67                   | 1.89                             |
| Canada           | 1.40              | 1.98                   | 2.77                             |
| Chile            | 1.20              | 1.83                   | 2.20                             |
| Kazakhstan       | 1.28              | 1.48                   | 1.89                             |
| Malaysia         | 1.20              | 1.75                   | 2.10                             |
| Netherlands      | 1.40              | 1.95                   | 2.72                             |
| Nigeria          | 1.01              | 1.37                   | 1.38                             |
| Norway           | 1.92              | 1.96                   | 3.77                             |
| Russian Federation| 1.29              | 1.51                   | 1.94                             |
| Saudi Arabia     | 1.49              | 1.45                   | 2.16                             |
| Turkmenistan     | 1.31              | 1.03                   | 1.34                             |
| Ukraine          | 1.22              | 1.36                   | 1.65                             |
| United Arab Emirates | 1.72            | 1.47                   | 2.53                             |
| United States    | 1.41              | 1.93                   | 2.72                             |
| Uzbekistan       | 1.19              | 1.11                   | 1.31                             |
| Venezuela, RB    | 1.19              | 1.27                   | 1.51                             |

Sources: World Bank staff estimates based on data from World Bank; IMF; Barro and Lee; Worldwide Governance Indicators; and the Polity IV Project.
### Table S3B.4. Economic performance index

| Country       | Data          |          |          |          |          |
|---------------|---------------|----------|----------|----------|----------|
|               | Country       | Output volatility | Employment growth | Employment level | Productivity level | Productivity growth |
| Australia     | −0.82         | 0.33     | 60.09    | 70,429.54 | 1.31      |
| Azerbaijan    | −7.79         | 0.17     | 58.78    | 5,462.36  | 7.52      |
| Botswana      | −5.05         | 0.31     | 60.00    | 13,837.47 | 1.89      |
| Canada        | −1.65         | 0.21     | 60.94    | 68,643.37 | 0.95      |
| Chile         | −2.57         | 0.24     | 51.16    | 20,279.92 | 2.01      |
| Kazakhstan    | −4.73         | 0.19     | 63.19    | 8,753.59  | 4.34      |
| Malaysia      | −3.98         | 0.09     | 60.02    | 14,053.67 | 2.35      |
| Netherlands   | −1.45         | 0.49     | 60.76    | 79,405.10 | 0.90      |
| Nigeria       | −5.95         | 0.07     | 51.51    | 3,023.27  | 2.55      |
| Norway        | −1.54         | 0.31     | 63.21    | 128,218.57| 1.02      |
| Russian Federation | −3.94  | 0.13     | 55.22    | 12,446.87 | 2.71      |
| Saudi Arabia  | −3.48         | 0.21     | 47.42    | 40,277.84 | −0.44     |
| Turkmenistan  | −6.89         | 0.10     | 53.73    | 5,860.53  | 6.23      |
| Ukraine       | −4.87         | 0.17     | 53.27    | 4,315.60  | 1.77      |
| United Arab Emirates | −3.60  | 0.18     | 74.54    | 58,630.13 | −3.97     |
| United States | −1.47         | 0.25     | 61.73    | 88,355.53 | 1.71      |
| Uzbekistan    | −2.87         | 0.16     | 52.97    | 1,755.10  | 2.40      |
| Venezuela, RB | −6.40         | 0.43     | 58.16    | 14,534.45 | −0.81     |

| Country       | Index         |          |          |          |          |          |
|---------------|---------------|----------|----------|----------|----------|----------|
|               | Country       | Output volatility* | Employment growth | Employment level | Productivity level | Productivity growth | Composite index |
| Australia     | 1.00          | 0.78     | 0.47     | 0.54      | 0.46      | 0.71      |
| Azerbaijan    | 0.00          | 0.56     | 0.42     | 0.03      | 1.00      | 0.34      |
| Botswana      | 0.39          | 0.76     | 0.46     | 0.10      | 0.51      | 0.44      |
| Canada        | 0.881         | 0.61     | 0.50     | 0.53      | 0.43      | 0.64      |
| Chile         | 0.75          | 0.66     | 0.14     | 0.15      | 0.52      | 0.49      |
| Kazakhstan    | 0.44          | 0.59     | 0.58     | 0.06      | 0.72      | 0.47      |
| Malaysia      | 0.55          | 1.00     | 0.49     | 0.61      | 0.42      | 0.72      |
| Netherlands   | 0.26          | 0.24     | 0.15     | 0.01      | 0.57      | 0.25      |
| Nigeria       | 0.90          | 0.75     | 0.58     | 1.00      | 0.43      | 0.76      |
| Norway        | 0.55          | 0.50     | 0.29     | 0.08      | 0.58      | 0.43      |
| Russian Federation | 0.62  | 0.06     | 0.00     | 0.30      | 0.31      | 0.32      |
| Saudi Arabia  | 0.13          | 0.47     | 0.23     | 0.03      | 0.89      | 0.31      |
| Turkmenistan  | 0.42          | 0.11     | 0.22     | 0.02      | 0.50      | 0.28      |
| Ukraine       | 0.60          | 0.58     | 1.00     | 0.45      | 0.00      | 0.54      |
| United Arab Emirates | 0.91  | 0.00     | 0.53     | 0.68      | 0.49      | 0.59      |
| United States | 0.71          | 0.55     | 0.20     | 0.00      | 0.55      | 0.45      |
| Uzbekistan    | 0.20          | 0.92     | 0.40     | 0.10      | 0.27      | 0.35      |

**Sources:** World Bank staff estimates based on data from World Bank, and Penn World Table.

**Note:** The values of the indicators in the Data section of this table are rescaled using the “min-max” method. The rescaled scores are presented in the Index section of the table. They are calculated by first subtracting the minimum score and then dividing by the difference between the minimum and maximum score. The maximum rescaled score is equal to 1 and the minimum rescaled score is equal to 0. The economic performance index is a composite index constructed as the unweighted average of the three economic outcomes: labor productivity level and growth, output volatility level, as well as employment participation growth and level.

a. Lower values indicate higher output volatility in the data section.
Notes
1 The countries are grouped into three: developed economies, successful developing economies, and underperforming economies, discussed further in this spotlight.
2 Programme for International Student Assessment of the Organisation for Economic Co-operation and Development.

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