Reinvigorating Growth in Resource-Rich Sub-Saharan Africa

Ivailo Izvorski - Souleymane Coulibaly - Djeneba Doumbia

WORLD BANK GROUP

Reinvigorating Growth in Resource-Rich Sub-Saharan Africa

Ivailo Izvorski - Souleymane Coulibaly - Djeneba Doumbia

WORLD BANK GROUP

Contents

List of Figures

List of Tables

List of Appendix

Acknowledgements

Abbreviations

AGOA	African Growth and Opportunity Act
BRICS	Brazil, Russia, India, China and South Africa
CEMAC	Central African Economic and Monetary Community
CFTA	Continental Free Trade Area
CPIA	Country Policy and Institutional Assessment
CWA	G20 Compact with Africa
DTF	Distance To Frontier
EAC	East African Community
EAP	East Asia and Pacific region
EBA	Everything but Arms
ECA	Excess Crude Account
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
EITI	Extractive Industries Transparency Initiative
EU	European Union
EXPY	Export sophistication
FDI	Foreign Direct Investment
FDPP	Fundo do Diferencial do Preço do Petróleo – Oil Price Differential Fund
FX	Foreign Exchange
G20	Group of Twenty
GDP	Gross Domestic Product
GCC	Gulf Cooperation Council
GVAR	Global Vector Autoregression
HIPC	Highly Indebted Poor Country
IMF	International Monetary Fund
LAC	Latin America and the Caribbean
LIC	Low-Income Country
LMC	Lower-Middle-income Country
MENA	Middle East and North Africa region
MIC	Middle-Income Country
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Countries
PASEC	Programme d'Analyse des Systèmes Educatifs de la Confemen
SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SADC	Southern African Development Community
SAR	South Asia Region
SSA	Sub-Saharan Africa
SCD	Systematic Country Diagnostic
SWF	Sovereign Wealth Fund
TFP	Total Factor Productivity
UMC	Upper Middle-Income Country
WDI	World Development Indicators
WEF	World Economic Forum
WEO	World Economic Outlook
WGI	World Governance Indicators
WTO	World Trade Organization

1. Overview

The strong economic performance of Sub-Saharan Africa's resource-rich countries since the start of the 21st century has been celebrated as a return to more buoyant growth and renewed convergence with the advanced economies.[1] Coupled with new discoveries of natural resources and expectations that commodity riches will be used to take a decisive swipe at poverty, these developments gave support to the view that Africa "can claim the 21st century" (Gelb 2000).

Figure 1. GDP Per Capita Relative to the United States

1968=100, PPP constant 2011 international US dollars

Legend: EAP, SSA, Resource-rich SSA

Source: Data from WDI, World Bank.
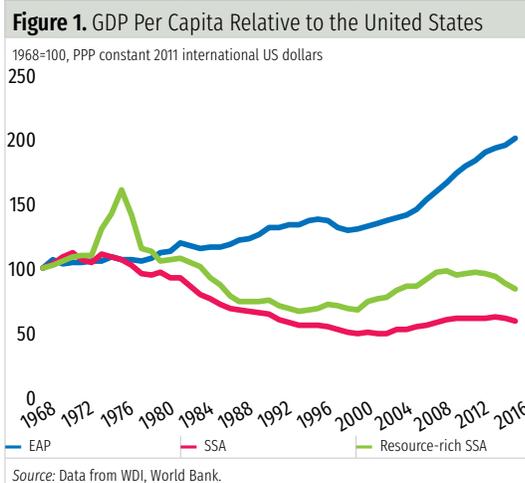
Despite the recent progress in improving living standards and reducing poverty, achieving high and sustainable growth continues to be the main challenge for policymakers. Resource-rich Botswana and resource-poor Mauritius have been the growth champions of Africa since the 1960s. Rwanda and Ethiopia have led Sub-Saharan Africa (SSA) in terms of per-capita growth since 2000, growing faster than South Asia. However, the gap between the resource-rich countries of Africa with East Asia and the Pacific (EAP), SAR, and the advanced economies has widened since 2010, underlining the difficulty of accelerating growth (Figure 1). Regardless whether the recent episode can be qualified as a recovery from the earlier slump or as a development success, the challenges to policymakers in building up human capital, infrastructure, and institutions and overcoming the burdens of distance and thick borders on the subcontinent remain.[2]

Africa has often been portrayed as a continent of boundless natural riches that have helped pull the whole subcontinent forward. Indeed, resource-rich Africa accounts for a dominant part of SSA's economy. Resource-rich SSA accounts for 70 percent of both the subcontinent's GDP and physical capital, 60 percent of its natural capital, and nearly 40 percent of its population. For the continent in aggregate and in per capita terms, however, natural resources are just a bit higher than in the South Asia Region (SAR) and lag all other developing regions.

One way of thinking of strengthening economic growth depends on more exploration and development of natural resources that should help increase the continent's natural wealth, as has happened in many other developing regions.[3] The foundations for improved foreign interest in natural resources, accelerated exploration, and extraction need to

---

1   For the purposes of this note, resource-rich SSA refers to the top 10 countries most endowed with natural resources per capita according to the World Bank's Changing Wealth of Nations 2018. These are: Nigeria, South Africa, Angola, Equatorial Guinea, Gabon, Sudan, Tanzania, Zambia, Botswana, and Republic of Congo. The resource-poor SSA refers to the 10 SSA countries with the smallest endowments of resources: Seychelles, Saô Tomé and Príncipe, Cabo Verde, Comoros, Gambia, Mauritius, Lesotho, Guinea-Bissau, Swaziland and Burundi. We provide more details below.

2   Edwards, Sebastian. 2012. Is Tanzania a Success Story. Part of the NBER Africa Project. http://www.anderson.ucla.edu/faculty/sebastian.edwards/Papers%20Files/Is%20Tanzania%20a%20Success%20Story.pdf

3   Sub-soil natural resources that have not yet been discovered or exploited do not count as national wealth. Similarly, agricultural land that is now fallow or producing modest yields adds little to natural wealth; its vast potential needs to be realized to be counted.

be solidified further by strengthening macroeconomic stability and political predictability, rule of law, and appropriate regimes for the extractive industries. At the same time, governments should get more revenues from the resource rents (which are shared with investors) while providing good incentives for companies to develop the resources.

More importantly, durable prosperity in resource-rich Africa depends on building up the assets, or components of overall wealth, that are in relatively short supply. In recent years, the literature has started to focus on assets and assets diversification as a path to development, and the World Bank has led in this area.[4] In this report, we emphasize the two complementary types of assets that Africa's resource-rich countries need to build up to accelerate growth: one is within national borders and the other across borders. We consider them in turn:

- Countries of resource-rich SSA need to build up their human capital and infrastructure while strengthening institutions and creating markets. Natural capital accounts for a substantial part of overall wealth in resource-rich SSA. Countries need better skills, machines, the connecting infrastructure and their public sector institutions to deliver efficient public services and provide a level playing field for companies and individuals to help reduce poverty and raise living standards for all.

- Regional integration is the other asset that is in short supply in resource-rich Africa. It is true that the resource-rich countries of Africa are now connected to global markets directly via their exports of commodities. By contrast, spillovers from their economies to their neighbors and the region are negligible and mostly through informal channels. Strengthening regional integration by building better linkages with neighbors will help improve the attractiveness of both the resource-rich countries and their neighborhoods to international and domestic investors. Spillovers will increase from the resource-rich countries to their neighbors and, crucially, they will flow back, resulting in larger economic agglomerations, denser regional value chains in non-commodity sectors, and more demand from firms and consumers.

The report asks several questions. How did the resource-rich countries of the continent do during the recent boom and bust of commodity prices? How did their governments manage natural resource rents during and after the boom? What can governments do to make better use of resources in the future? We summarize the answers to these questions below and develop them in detail in the rest of the report.

Key Messages

Message 1: **Africa is rich in natural resources, but its resource wealth is one of the lowest among the world's developing regions, both in aggregate and per capita terms.** This observation contrasts with the traditional assessment of the region as exceptionally resource-abundant. Africa's natural wealth could rise substantially in a generation, provided exploration

---

4   See Gill, Indermit, Ivailo Izvorski, Donato De Rosa and Willem van Eeghen. 2013. Diversified Development; Tchana, Fulbert. 2016. Republic of Congo Notes on Economic Diversification; Lange, Glenn-Marie, Quentin Wodon, Kevin Carey. 2018. The Changing Wealth of Nations.

picks up, the long delays in development of extractive projects recorded last century are shortened substantially, and the low yields on agricultural crops are given a boost.

Message 2: **Africa's resource-rich countries grew faster than resource-rich comparators in other regions since the start of the 21st century.** This observation, which will be a surprise to many, suggests that even higher growth is possible in resource-rich Africa. Resources need not be a curse or a destiny, they can be a powerful opportunity out of poverty and towards prosperity.

Message 3: **Fiscal policy was strongly pro-cyclical both during and after the boom in commodity prices, resulting in extremely volatile spending that exposed the economy to harmful fluctuations and lack of predictability.** With few exceptions, the conversion of natural resource rents into capital has been inefficient and genuine savings have been negative, indicating substantial loss of resources. Moving to counter-cyclical fiscal policy and more predictable government spending patterns is essential for sustaining macroeconomic stability and boosting fixed investment.

Message 4: **Stronger and sustainable economic growth is possible in resource-rich Africa.** To reinvigorate growth, countries need to build up the assets or components of wealth, that are in relatively short supply: human and physical capital, and institutions. A larger and more balanced asset portfolio will help bolster the non-resource sector in the resource-rich economies and help with the discovery and development of additional natural resources that will help finance an ambitious development agenda. The appropriate policies may ultimately result in more diversified exports and production structures, but this need not be a priority. Governments, instead, need to concentrate on the following:

- *Make human capital development a priority.* Early child development, as well as primary and secondary education, need to be strengthened to deliver not only improved access but improved learning. Access to secondary education may have risen but at 40 percent, it is still too low. Expanding access to education and emphasizing rapid and durable improvements in the quality of learning are essential for success.
- *Improve the business climate and the competition regime* to facilitate larger and sustainable increases in investment, including in exploration and development of natural resources.
- *Adopt a sound counter-cyclical fiscal policy with robust government spending on the key priorities of human and physical capital underpinned by enhanced domestic resource mobilization.* Counter-cyclical fiscal policies will help strengthen macroeconomic stability and help limit the impact of commodity price volatility on the economy. Enhanced domestic resource mobilization will help create the fiscal space needed to bolster government spending on human capital and infrastructure while setting up robust buffers to help support policy in future downturns.

Message 5: **The second essential pillar for rejuvenating growth in resource-rich SSA includes building up the institutions for regional integration to overcome the burdens of low density, thick borders, and long distances.** While SSA has established numerous integration arrangements and there has been progress in bringing the countries of the continent together, spillovers from the resource-rich countries to their neighbors have been

negligible, including from Angola, Nigeria, and South Africa, the region's the largest resource-rich middle-income countries (MICs). Africa's resource-rich countries have integrated globally through their natural resources—and not through abundant labor like East Asia or physical and institutional capital like Europe. Today's rapid globalization and technological advances require much more sizable agglomeration economies than are now available in Africa. The road ahead lies in building up the asset of regional integration, especially around the large resource-rich MICs in the region. Integrating better with their neighbors and the rest of the continent will boost their economic mass and connectivity and will help investors see them as investment friendly destinations. The domestic markets of even the larger resource-rich countries could benefit from additional linkages with neighbors and more opportunities to deliver stronger, sustainable, and more inclusive growth.

Figure 2. Income, Education, and Health Indicators, 1990–2011

average years of schooling population aged 25 and over
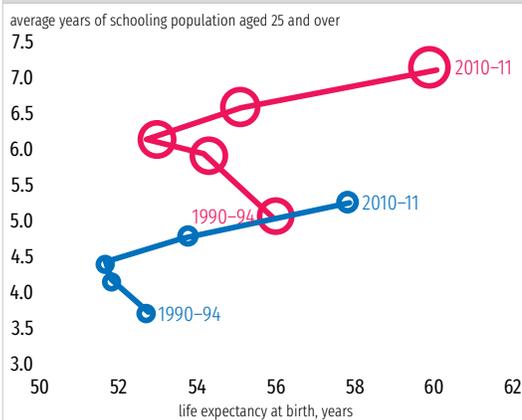
Source: World Bank WDI and Barro and Lee (2013).
Note: Each data point shows a non-overlapping 5-year average value. The size of the bubble represents the relative per capita income.

Figure 3. Poverty in SSA, 1991–2011
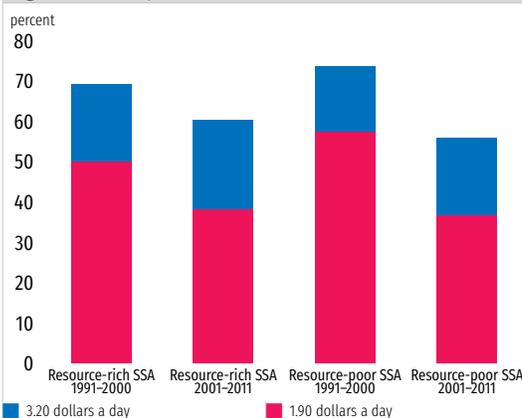
Source: Data from PovCalnet, World Bank.

The Development Achievements of Resource-Rich Africa

Natural resources have helped bolster Africa's prosperity. Many more people have been able to access education and average years of schooling have risen in the last 20 years—much more in the resource-rich countries than in the rest of SSA.[5] Similarly, life expectancy made larger gains in the resource-rich areas of the continent (Figure 2). Although there has been modest progress in reducing poverty, in SSA its decline has been slower than in the rest of the world. (Gill et al. 2016). Poverty in resource-rich SSA fell by almost 9 percentage points (pp) in the first decade of the 21st century relative to the last decade of the 20th century, yet the drop in the resource-poor parts was nearly 15 pp (Figure 3).

The slow progress in reducing poverty reflects the moderate pace of Africa's economic growth. Since 2000, real GDP growth per capita in SSA has lagged that of all developing regions other than LAC, a region with much higher income per capita (Figure 4). And of all SSA countries, since 2000 only resource-poor Rwanda and Ethiopia have managed to average faster growth than South Asia, becoming Africa's champions with compound growth rates of about 5.5 percent (Figure 5).

Resource-rich SSA countries have grown faster than their resource-poor neighbors since 2000, except for 2015–16, when commodity prices plunged. Since 2000 five of Africa's 10 resource-rich countries have grown faster than the SSA average. Two of these were the largest MICs in the region, Nigeria and Angola; meanwhile South Africa and Kenya trailed (Figure 6a). After GDP contracted in

---

5   The 10 resource-rich SSA countries discussed here are: Nigeria, South Africa, Angola, Equatorial Guinea, Gabon, Sudan, Tanzania, Zambia, Botswana, and Republic of Congo. When we explicitly use the term "resource-poor SSA", we mean the 10 SSA countries with the smallest endowments of resources: Seychelles, Saô Tomé and Príncipe, Cabo Verde, Comoros, Gambia, Mauritius, Lesotho, Guinea-Bissau, Swaziland and Burundi.

Figure 4. Per-capita GDP Growth Across Developing Regions, 2000–16

annual percent change

2000–04   2005–09   2010–14   2015–16

Source: World Development Indicators.
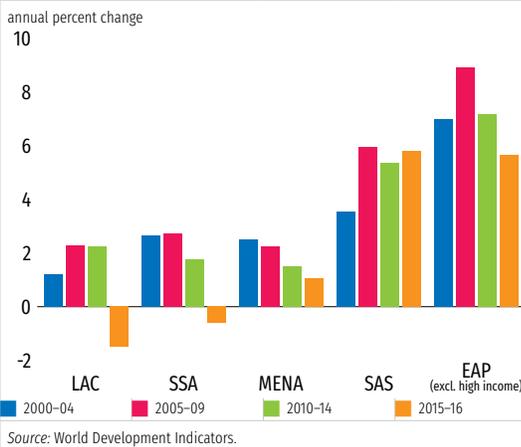
Figure 5. Cumulative Per Capita Growth, 2000–16

in percent change measured from GDP per capita in constant 2010 US dollars

Source: WDI.
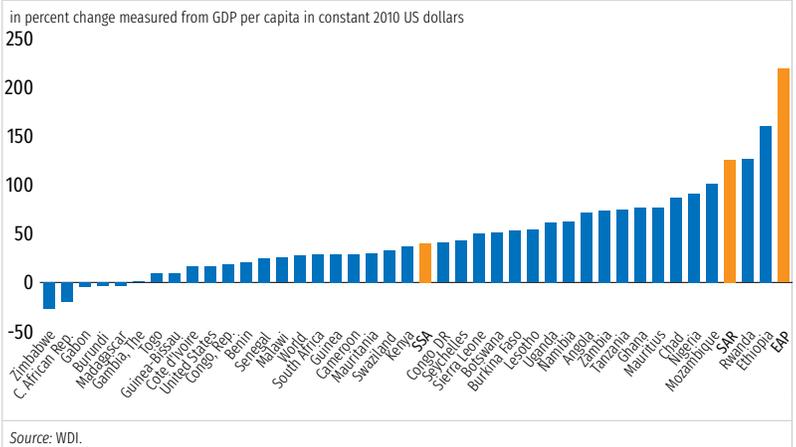
Figure 6. Growth in Resource-Rich and Resource-Poor SSA, 1990–2016

a. Growth rates of GDP per capita, 1990–2016

percent change

— Resource-rich SSA   — Resource-poor SSA

b. Growth rates of GDP per capita, sub-periods

percent change

Resource-rich SSA   Resource-poor SSA   Other resource-rich countries

Source: WDI, World Bank
Note: The values in these figures are unweighted averages of per capita growth. Other resource-rich countries include the top 30 countries in terms of natural capital per capita, excluding the four African countries in the top 30 (Angola, the Republic of Congo, Equatorial Guinea, and Gabon).

2015–16, the average level of GDP per capita in resource-rich SSA was equal to 135 percent of the level in resource-poor SSA.

For most of this century, the contribution of productivity has been modest in resource-rich SSA. Total factor productivity (TFP) contributed about half of GDP growth in 2000–04 as techniques for exploration and production of natural resources improved. Its contribution then began to drop (Figure 7). Contributions from productivity were only modestly stronger in resource-poor SSA in 2000–15. As a caveat, however, in SSA TFP was strongly procyclical, a concern raised in other regions as well. While problems with measurement are well known, this large procyclical component may in the aggregate make analysis of TFP much less valuable.

Remarkably, resource-rich SSA grew by ¼ percent a year faster than comparator resource-rich countries elsewhere. Part of this reflects the lower base, but part is due to improvements in institutions and the spurt of new extraction since 2000 (Figure 6b).

For most of this century, the contribution of productivity has been modest in resource-rich SSA. Total factor productivity (TFP) contributed about half of GDP growth in 2000–04 as techniques for exploration and production of natural resources improved. Its contribution then began to drop (Figure 7). Contributions from productivity were only modestly stronger in resource-poor SSA in 2000–15. As a caveat, however, in SSA TFP was strongly procyclical, a concern raised in other regions as well. While problems with measurement are well known, this large procyclical component may in the aggregate make analysis of TFP much less valuable.

The structure of the economies of resource-rich countries is being transformed. The share of agriculture in value added declined

Figure 7. Contributions of Productivity to Growth

a. Resource-rich SSA
in percent

b. Resource-poor SSA
in percent

| ■ Total factor productivity | ■ Labor | ■ Capital stock |

Source: WDI data.
Note: Calculations used simple growth accounting (Solow model), δ=6%, α=40%. Unweighted averages of GDP growth rates are presented in these figures.
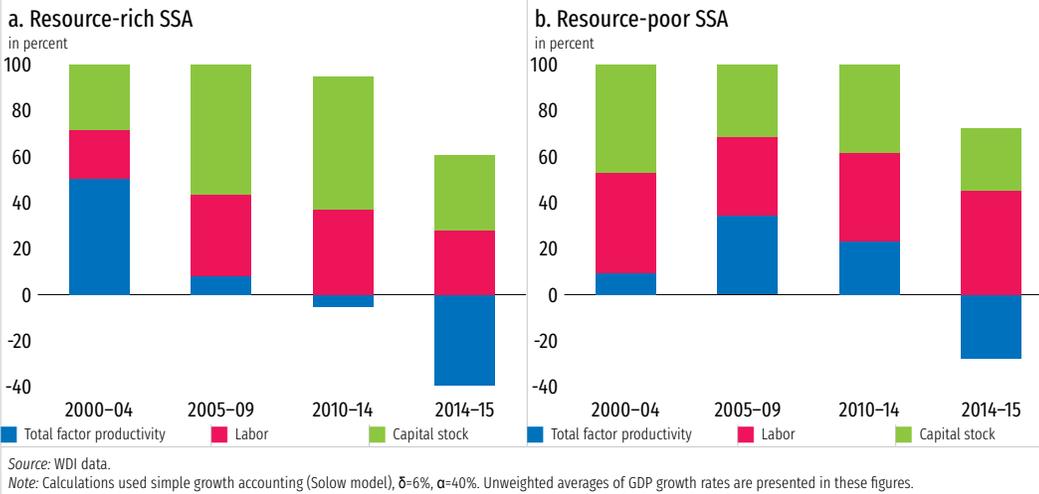
Figure 8. Share of Agriculture, Industry and Services in Value Added and Employment, 2001–15

a. Value-added, resource-rich SSA
in percent

b. Value-added, resource-poor SSA
in percent

c. Employment, resource-rich SSA
in percent

d. Employment, resource-poor SSA
in percent

| ■ Agriculture | ■ Industry | ■ Services |

Source: WDI, World Bank, ILOSTAT, International Labour Organization).
Note: Values in these figures are unweighted averages. For the value-added panels the sample is balanced for resource-rich countries but unbalanced for resource-poor SSA countries, and for employment it is balanced for all.

by about 10 pp in resource-rich SSA, more than in the resource-poor parts, in line with patterns observed in other developing regions over the last several decades (World Bank 2013). The share of industry declined from 38 percent of value added in 2000 to 32 percent in 2016 despite the increased contribution from the extractive industries (Figure 8).

Economic transformation in Africa will need a much more productive and vibrant agricultural sector. The opportunities are there. As pointed out in a recent study, at 200 million hectares, sub-Saharan Africa is home to nearly half of the world's uncultivated land that can be brought into production. Africa uses only 2 percent of its renewable water resources compared to 5 percent globally.[6] Improving Africa's infrastructure and reliability of energy supply—notably, electricity—should go a long way in helping farmers be more productive. This agenda links directly with the need for more efficient public investment spending, as discussed later in this report. Other policies are also essential, including improving the business environment to make new technology, seeds and extension services more easily available to Africa's farmers.

---

6   https://www.brookings.edu/blog/africa-in-focus/2016/01/22/foresight-africa-2016-banking-on-agriculture-for-africas-future/

2. Characterizing Resource-Rich Sub-Saharan Africa

Africa is a resource-rich continent. But until recently exploration efforts and discoveries were modest. Agricultural yields were among the lowest in the world, negatively affecting the value of agricultural land. As a result, the value of SSA's natural wealth has stagnated for more than 20 years, and its per-capita natural wealth has plunged to just above that of the rising South Asia Region. With modest levels of physical and human capital, lower natural capital explains the lower overall wealth in SSA. More exploration and development efforts should boost SSA's proven natural resources and add to its natural capital.

Resource-Rich, but Not as Rich as Most Other Regions

SSA's aggregate natural capital amounted to one-third of that of the EAP region, which has the most abundant natural wealth; among developing regions SSA is second from the bottom, above only SAR. Fossil fuels dominate SSA's natural capital, lifting the region above SAR and LAC on this measure (Figure 9).[7] SSA's metals endowment leaves it below LAC and close to the levels in SAR (Appendix 1).

There has been a substantial widening of the difference between estimates of natural capital in SSA and in other regions since 1995, when the first comprehensive accounting of natural capital was compiled by the World Bank Wealth of Nations project. In 1995, SSA's aggregate natural capital was estimated as above that of the Middle East and North Africa (MENA) and the SAR regions and not very different from that of the LAC countries. Over the last two decades, estimates of total SSA natural wealth have increased by about one-fifth; meanwhile, the natural wealth of the rest of the world has almost tripled, mainly because of new discoveries in MENA and EAP.

Regional aggregates hide large differences between countries. Measured in terms of natural capital per person, Gabon is the 10th richest country in the world. Gabon, Equatorial Guinea, the Republic

Figure 9. Africa's Aggregate and Per Capita Natural Wealth, 1995–2014

a. Overall natural wealth
in US dollars, billions

b. Natural wealth per capita
in US dollars, thousands

Source: The Changing Wealth of Nations database (2018), World Bank.

---

7   This note uses the definitions in the World Bank 2018, *Changing Wealth of Nations*, to calculate natural resources per capita and rank countries. Natural capital is the sum of crops, pasture land, timber, nontimber forest, protected areas, cropland, pasture land, oil, natural salt, coal, and minerals. Natural capital per capita is calculated using the natural capital in the database divided by population. The GDP-weighted values use GDP PPP, 2011 international dollars.

of Congo, and Angola are the four SSA countries in the global ranking of 30 resource-rich countries (Figure 10). The other resource-rich SSA countries have much lower endowments in per capita terms; for example, Kenya comes in at 133rd.

Figure 10. Natural Capital per Capita (Gabon=1), 2014

Source: The Changing Wealth of Nations (2018) dataset, World Bank.
Note: Relative figures: Gabon=1, Qatar=6.9, Kuwait=6.1; the same scale applies to all. Countries with data for all components of wealth are presented. The top 30 countries in natural wealth per capita are listed above the dotted line.
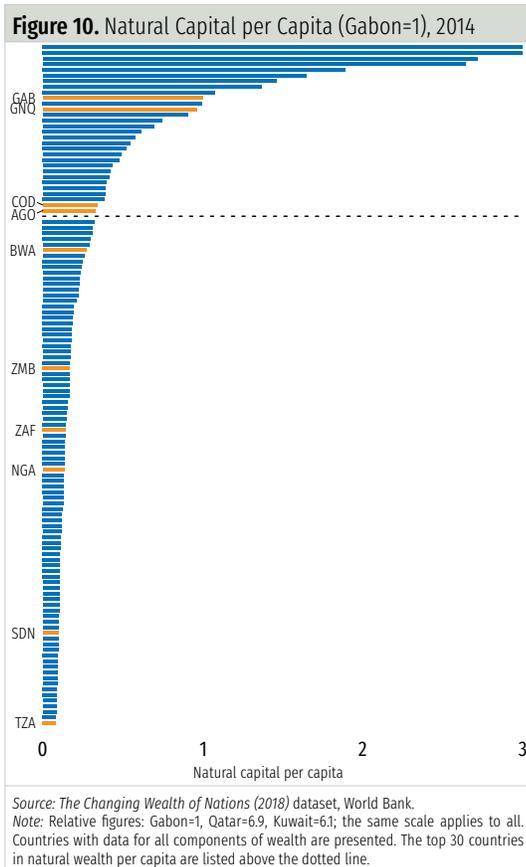
SSA's low numbers for natural wealth are due to a combination of less exploration of oil, natural gas, metals and other subsoil resources and low yields on land, forests, and other above-ground resources. Natural resources per square km amount to about $25,000 in SSA compared with $130,000 in the OECD (Collier 2011, McKinsey Global Institute 2013). There is no reason to believe that SSA is much less well-endowed with subsoil resources and in fact geologists suggest the opposite. Increased recent spending on exploration in Africa has uncovered substantial opportunities underground that may transform SSA's development prospects. In 2000–12, just before the plunge in oil prices, global spending by large mining and oil exploration companies quintupled; in Africa, including North Africa, outlays were about $100 billion in 2012. The companies have also discovered giant oil fields offshore in both East and West Africa (World Bank 2015).

Here lies a great opportunity: to improve government institutions and policies, reduce the political and contract risks for exploration companies, and lower the lead time between discovery and production. These goals are complementary to policies and institutions we discuss later as necessary to fully exploit natural resource abundance for economic development. Lead times are reduced by improving the quality of government and market institutions (Khan, Tehmina et al. 2016). Arezki at al. (2016) estimate that natural wealth per capita could be as much as 25 percent higher if the quality of SSA's institutions were to match that of OECD countries. Their study suggests that in 1950–89, OECD countries accounted for 37 to 50 percent of total worldwide natural resource discoveries and Africa for less than 9 percent. In the last decade, the share of SSA nearly doubled to 17 percent.

Similarly, above-ground natural resources are likely to have much higher yields with better institutions, irrigation, and extension services. At present, cereal yields in SSA are less than half of those in South Asia and a fourth of those in North America. Better institutions and better agricultural methods will yield larger, higher-quality crops and enhance estimates of above-ground natural capital.

For the purposes of this report, we rank the resource-rich countries by their per-capita natural resource endowment, i.e., both under-ground and above-ground resources. The top 10 in SSA are Nigeria, South Africa, Angola, Equatorial Guinea, Gabon, Sudan, Tanzania, Zambia, Botswana, and Republic of Congo.[8] The group is diverse. They are in eastern, western, and southern Africa. They vary remarkably in population and area. Among them are the three

---

8   To account for the size of each country's economy and its potential impact on neighbours and the continent, we weight the resource endowment by the country's share of SSA GDP.

largest middle-income SSA countries: Angola, Nigeria and South Africa, that together account for nearly two-thirds of SSA's GDP.

For comparison, we also present a group of Africa's resource-poor countries. The 10 with the least natural capital—the resource-poor SSA countries—are Seychelles, Saô Tomé and Príncipe, Cabo Verde, Comoros, Gambia, Mauritius, Lesotho, Guinea-Bissau, Swaziland, and Burundi. Their average natural capital per capita is just one-fifth that of the top 10 resource-rich countries.

Not Very Resource-Abundant but Very Resource-Dependent

SSA is strongly dependent on its natural capital. Natural resources dominate the structure of wealth in Africa: the share of natural capital in the continent's aggregate wealth is the second highest in the world after the countries that form the hydrocarbon-rich Gulf Cooperation Council (GCC) (Figure 11). Even resource-poor SSA, with its relatively low level of natural capital per capita, has a share of natural capital in total wealth that is higher than resource-rich MICs outside Africa. While paradoxical at first glance, it is the consequence of the fact that the contributions of human and physical capital to total wealth are modest both in resource-rich and resource-poor Africa.

On average, the resource-rich SSA countries are more dependent on natural resources than resource-rich advanced economies but a bit less than resource-rich developing countries generally.

Figure 11. Share of Natural Capital in Total Wealth by Region, 2014
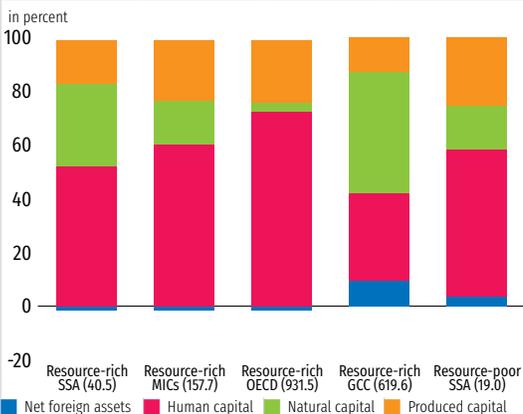
Source: The Changing Wealth of Nations (2018) dataset, World Bank.
Note: The numbers in parentheses are weighted average wealth per capita (sum of total wealth divided by sum of total population for countries in each groups) expressed in 2014 US$ thousands. The resource-rich SSA group does not include Angola because the value of its total wealth is unavailable. The other countries are grouped as in Gill et al. 2014. The resource-rich MICs are Argentina, Brazil, Colombia, Ecuador, Gabon, Malaysia, Mexico, Peru, Romania, Suriname, Tunisia, and Venezuela. The OECD resource-rich countries are Australia, Canada, Denmark, Netherlands, Norway, United Kingdom, and United States. The GCC comprises Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Bahrain, and Oman.

Figure 12. Dependence on Natural Resources, Regions and SSA, 2008
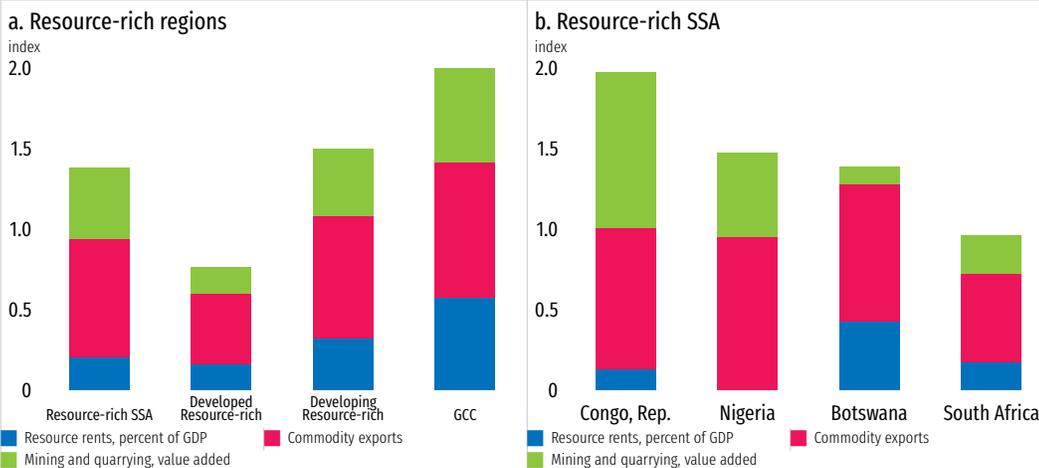
Source: United Nations National Account Statistics, UN Comtrade and WDI.
Note: The values of the three sub-indicators in the figure are rescaled using the "min–max" method. Index dependence is constructed as the sum of the three indicators: mining and quarrying value-added as a share of GDP, commodity exports as a share of total merchandise exports, and resource rents as a share of GDP. Index range is 0 to 3; countries with higher values are more dependent. Angola is not included in the SSA resource-rich group because the value of its share of commodity exports is not available. The other countries are grouped as in Gill et al. 2014. Developing resource-rich countries are Botswana, Chile, Malaysia, Nigeria, Saudi Arabia, and Venezuela. Developed resource-rich countries Australia, Canada, Netherlands, Norway, United Arab Emirates, and United States. Canada was dropped because of a missing value for the mining and quarrying variable.

Figure 13. Components of Natural Wealth in Resource-rich SSA, 2014
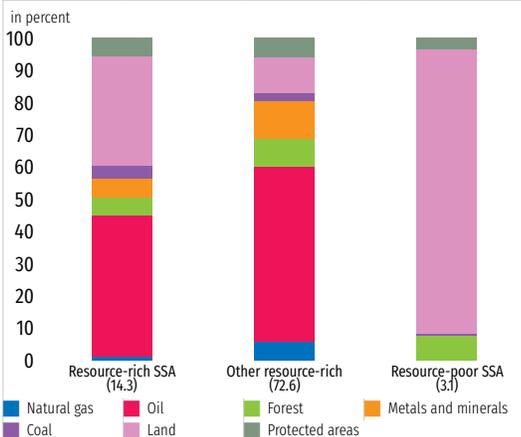
in percent

Source: The Changing Wealth of Nations (2018) dataset, World Bank
Note: The numbers in parentheses are weighted average natural capital per capita expressed in 2014 US$ thousands (calculated as the sum of total natural capital divided by the sum of population for countries in each group). Other resource-rich countries are the top 30 countries excluding Angola, Equatorial Guinea, Gabon, and Republic of Congo.

Figure 14. Total Wealth by Region

constant 2014 US dollars per capita, in thousands
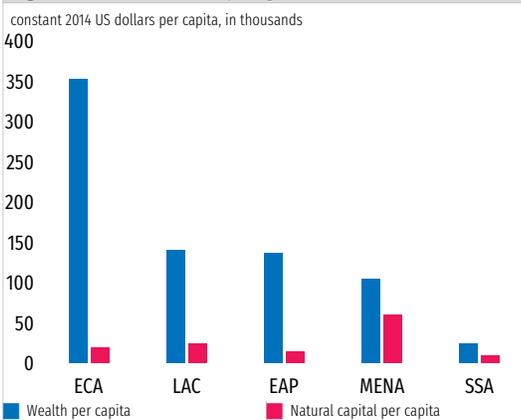
Source: The Changing Wealth of Nations (2018), World Bank.

Figure 15. Wealth of Resource-rich SSA and Other Countries

constant 2014 US dollars per capita, in thousands
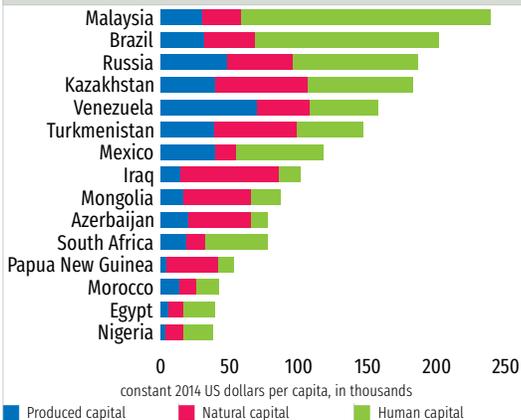
Source: The Changing Wealth of Nations (2018), World Bank.

A country's dependence on natural resources can be measured in at least three ways: the extent to which the country depends on natural resources exports for foreign exchange, the share of natural resources in its production, and the contribution of resource rents to government revenues (Figure 12).[9]

The resource dependence of resource-rich SSA countries also varies. The Republic of Congo is more dependent than other developing and developed resource-rich countries, including the GCC (Figure 12). Meanwhile, South Africa is less reliant on natural resources.

Diverse Natural Wealth

The composition of SSA's natural wealth is diverse, much more on average than in other resource-rich countries, which suggests substantial trade benefits. Oil accounts for 43.5 percent of resource-rich SSA wealth, substantially less than in resource-rich comparators outside Africa, and land accounts for about 35 percent (Figure 13). For five of the resource-rich SSA countries—Equatorial Guinea, Gabon, Angola, Nigeria, and the Republic of Congo—oil accounts for more than half of their natural wealth. Metals and minerals account for 27 percent for Zambia, 26 percent for South Africa, and 14 percent for Botswana. In resource-poor SSA countries, land accounts for the largest share of natural capital, as much as 60 percent in Tanzania. Coal and minerals together are dominant in South Africa.

Low Overall Wealth

Total wealth is much lower on average in resource-rich SSA than in most other developing regions. It is only one-sixth as much as in LAC (Figure 14). Even in the largest MICs of SSA, Nigeria and South Africa, wealth per capita is a fraction of what it is in Brazil and Malaysia, the wealthiest MICs in LAC and EAP. These differences in wealth are closely correlated with the much higher shares of human capital in total wealth in LAC and EAP (Figure 15). The per capita produced capital of both South Africa and Nigeria is below that of every major commodity exporter in all developing regions.

9   See Gill et al. 2014. Diversified Development. World Bank. To measure these three dimensions, we constructed an index ranging from 0 (less dependent) to 3 (more dependent).

The three largest MICs in SSA—Angola, Nigeria, and South Africa—are rich in resources. They are spread around the continent (Central Africa for Angola, Western Africa for Nigeria, and Southern Africa for South Africa). Oil dominates Angola and Nigeria's wealth, coal and minerals South Africa's. This somewhat diversified base could drive resource-rich SSA's growth if windfalls derived from these natural resources during good times are converted efficiently into other forms of capital and the resource-rich countries become much more vibrantly linked to their neighbors. Growth spillovers from resource-rich Africa will return in demand from the neighbors of these countries, engendering a virtuous cycle. We return to this important point in Chapter 5.

Exports and Diversification

Commodities dominate the exports of resource-rich Africa, accounting for 65 percent of the total for the 10 resource-rich countries, though they range from as little as 16 percent of total exports in Tanzania to 45 percent in South Africa and to nearly 99 percent in Angola (Figure 16). The average is not very different from the 65 percent in resource-rich Eurasia but is much higher than the 44 percent in resource-rich EAP.[10] This confirms our earlier conclusion that though the continent is not yet very resource-rich, it is very resource-dependent.

The factor intensity of exports yields another insight. About 66 percent of the exports of resource-rich SSA are resource-intensive and 44 percent of those of resource-poor SSA are labor-intensive (Figure 17). The intensity of exports tracks the relative resource endowments, although resource-rich SSA has abundant labor that with appropriate policies and institutions could boost each country's economic potential. The endowments of resource-rich SSA and Eurasia are similar, as is the resource-intensity of their exports. Resource-poor SSA, like East Asia 25 years ago, is substantially labor-intensive. Exports from the EU and increasingly East Asia are more intensive in capital, the relatively dominant endowment.

Figure 16. Share of Commodities in Total Exports, 2014

Source: Data from United Nations Comtrade, SITC Rev. 3.
Note: Commodity exports are recorded in SITC, Rev. 3 sections: 27, 28, 32, 33, 34, 68, 67 and 667.
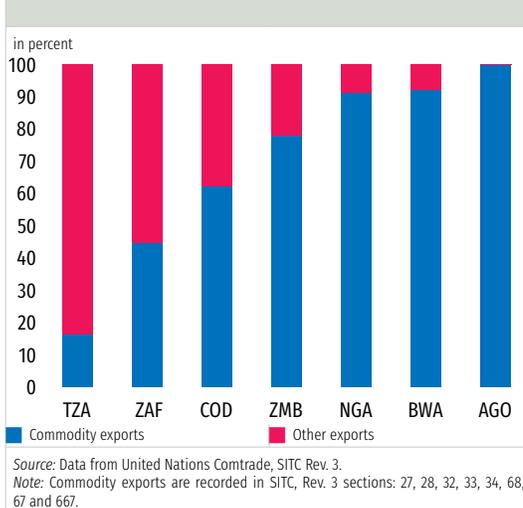
Figure 17. Different Endowments, Different Export Intensity

Source: Calculations using comtrade data and Krause (1987).
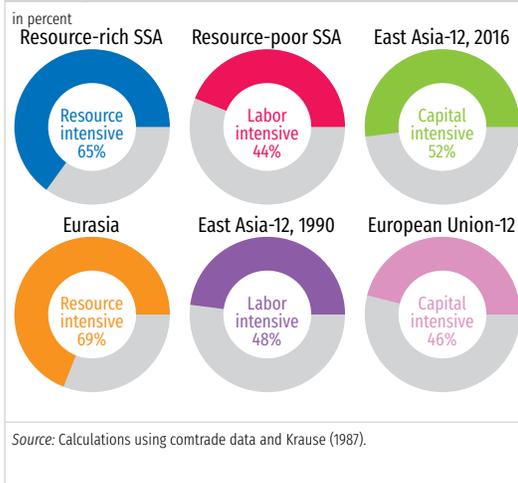
10   Resource-rich Eurasia comprises Azerbaijan, Russia, Kazakhstan, Turkmenistan, Ukraine, and Uzbekistan. Resource-rich EAP comprises Indonesia, Lao, Malaysia, Mongolia, and PNG.

Figure 18. Export Concentration, Resource-rich and Resource-poor SSA, 2000 and 2010

a. Resource-rich SSA

	2000	2010
South Africa	0.015	0.018
Tanzania	0.064	0.056
Zambia	0.279	0.269
Botswana	0.677	0.364
Nigeria	0.987	0.511

Herfindahl-Hirschman index

b. Resource-poor SSA

	2000	2010
Mauritius	0.082	0.052
Lesotho	0.139	0.048
Gambia	0.228	0.094
Cabo Verde	0.258	0.198
Seychelles	0.428	0.349
Comoros	0.535	0.375
Burundi	0.548	0.371
São Tomé and Príncipe	0.828	0.717

Herfindahl-Hirschman index

■ 2000   ■ 2010

Source: Comtrade data.
Note: The Herfindahl-Hirschman index measures the concentration of exports across products in terms of the importance of exported good in aggregate exports.

The export structure of resource-rich Africa is on average more concentrated than that of its resource-poor counterparts. While export concentration is very low in South Africa, it is high in Nigeria. In resource-poor SSA, the exports of Saô Tomé and Príncipe are the least diversified, even setting aside natural resources, and those of Mauritius are the most diversified (Figure 18). Export concentration as measured by the Herfindahl-Hirschman index varies in both resource-rich and resource-poor SSA. Lack of large resource endowments is neither necessary nor sufficient for a diversified export structure.

Figure 19. Export Concentration, Resource-Rich SSA Countries, 2000–10

Theil index

■ 2000   ■ 2005   ■ 2010

Source: IMF, Diversification database.
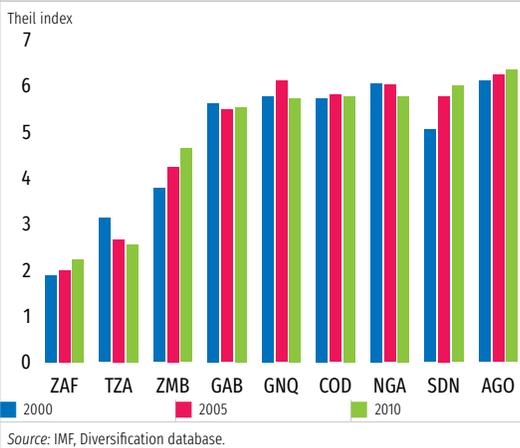
Resource-rich Africa has not diversified its exports. The exports of the more resource-abundant economies have either become more concentrated or changed little, as measured by the Theil index of the export basket (Figure 19). Tanzania has seen some export diversification, but its resource endowment is the lowest of the resource-rich economies and the change is barely statistically significant.

New products have been added to the exports of resource-rich Africa in response to new exploration and development. In Angola, petroleum accounted for 91 percent of the country's exports in 2015, down from 95 percent in 2000, although the share is again rising with the recovery in oil prices (Figure 20). In constant prices, however, Angola has seen a shift to greater export concentration.

Given the only slight change in the dominance of natural resources in exports, the traditional export sophistication statistic (EXPY), which defines a country's notional income based on its exports, mainly indicates the shifting composition of the markets to which commodities are exported. For the three resource-rich SSA MICs, that measure—Hausmann's EXPY—has risen substantially over the last decade.[11] Of these countries, in 2015

---

11   Hausmann, Hwang and Rodrik (2007) define: $PRODY_k = \sum_j ((x_{jk}/X_j)) / (\sum_j (x_{jk}/X_j)) \, Y_j$
This metric is calculated as the revealed comparative advantage-weighed income per capita of each country exporting product k. $EXPY_{jt}$ is calculated as a weighted average of the productivity level associated with product k where the weights are the shares of products in a country's total exports: $EXPY_{jt} = \sum_k (x_{jk}/X_j) \, PRODY_k$

Figure 20. Top Exports in Selected Resource-rich SSA Countries

in percent

Angola

2000

2015

Petroleum oils, oils from bituminous minerals, crude

Petroleum gases and other gaseous hydrocarbons; liquefied, n.e.c. in heading no.2711

Shrimps and prawns; frozen

Diamonds (industrial) unworked or simply sawn, cleaved

Naphthalene

Oils petroleum, bituminous, distillates, except crude

Cuttle fish, squid; frozen, dried, salted or in brine

Diamonds (jewellery) unworked or simply sawn, cleaved

Other products

Nigeria

2000

2015

Petroleum oils, oils from bituminous minerals, crude

Petroleum gases and other gaseous hydrocarbons; liquefied, natural gas

Petroleum gases and other gaseous hydrocarbons; liquefied, propane

Wood; in the rough, whether or not stripped of bark or sapwood, or roughly squared, untreated, n.e.c.

Oils petroleum, bituminous, distillates, except crude

Cocoa beans; whole or broken, raw or roasted

Other products

South Africa

2000

2015

Gold in unwrought forms non-monetary

Diamonds; whether or not worked, but not mounted or set, unsorted

Platinum unwrought or in powder form

Bituminous coal, not agglomerated

Other products

Diamonds (jewellery) unworked or simply sawn, cleaved

Diamonds (jewellery) worked but not mounted or set

Source: Data from the Observatory of Economic Complexity (OEC).
Note: Based on HS92 6-digit products.

Nigeria had the highest export sophistication. Export sophistication was also higher in Angola, Nigeria, and South Africa in 2015 than in selected neighboring countries (Figure 21).

Because commodities dominate the export basket of the three better-endowed MICs, greater measured sophistication is a consequence of penetration of higher-income markets or rising incomes in the export markets, rather than genuine growth of more sophisticated products. For resource-rich countries in SSA, penetrating higher-income markets is an important initial step toward higher growth (Figure 22). The next step will be diversifying the asset base, the production base of the economy, to create new products and new services and use these to penetrate new markets.

Figure 21. Market Penetration and Income Per Capita Compared, 2000–15

in thousands

Resource-rich SSA MICs — Selected neighbors

2000   2007   2015

Source: Hausmann, Hwang and Rodrik (2007) methodology; 6-digit product data from BACI and CEPII (Centre d'Etudes Prospectives et d'Informations Internationales).
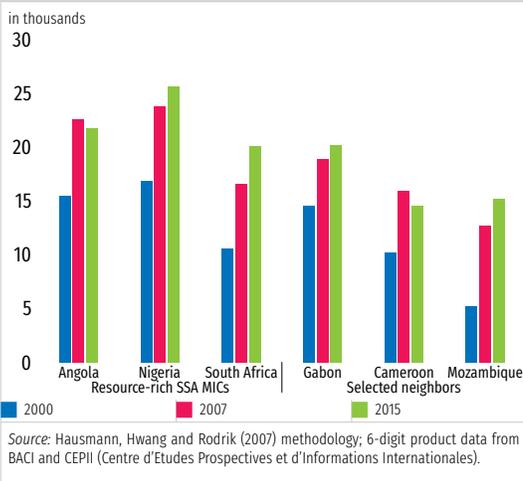
Figure 22. Export Sophistication and Growth in Per Capita GDP, 2000–15

export, sophistication, growth

GDP per capita, growth

Source: 6-digit product data (BACI, CEPII) and Hausmann et al. (2007) methodology.
Note: Values are expressed in compound annual growth. The figure shows the four SSA resource-rich MIC and comparators (other lower or upper middle-income countries).
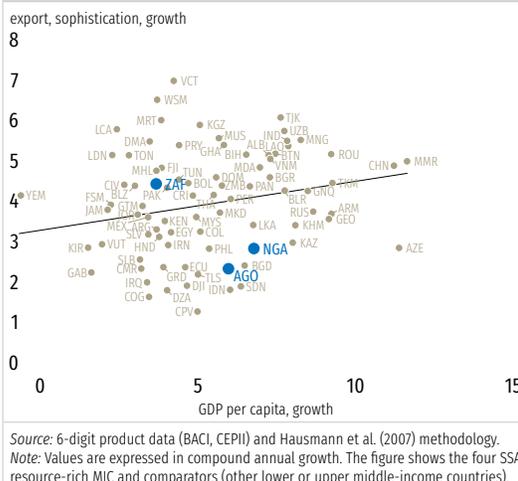
Although resource-rich SSA depends on only a few export markets, it is much less dependent on Asia than are the GCC countries. China accounts for less than 50 percent of Angola's exports and India buys only about 20 percent of Nigeria's oil (Figure 23). By contrast, largely because of propinquity and established presence, Asia accounts for more than 50 percent of the exports of Kuwait, Qatar, and Saudi Arabia. Asia is also a large market for Eurasian products: Turkmenistan's exports to China represent more than 75 percent of its total exports (Figure 24).

Figure 23. Top Export Destinations, Selected Resource-rich SSA Countries, 2015

Source: Observatory of Economic Complexity.
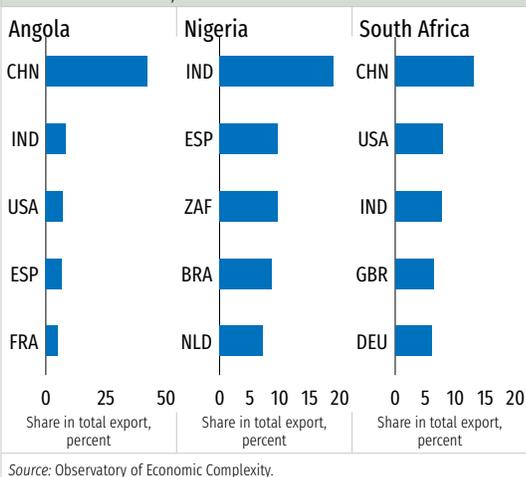
Figure 24. Top Export Destinations, Selected Other Resource-rich Countries, 2015

Source: Observatory of Economic Complexity.
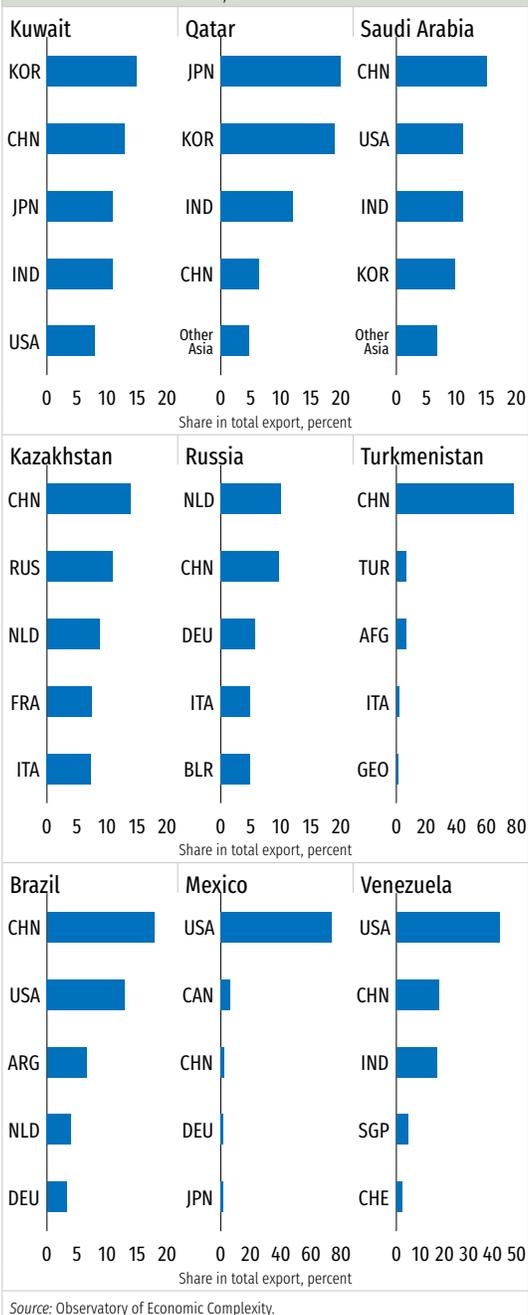
3. Fiscal Policy and Managing Natural Resource Rents

Managing well natural resource rents—a crucial source of development finance—is an essential function for the governments of the resource-rich SSA economies. There are three components of good management. One is the design and implementation of fiscal policy to limit the impact of resource volatility on the economy; it has been widely established that governments need to run counter-cyclical fiscal policy in both good and bad times. The other is the tradeoff between the interests of current and future generations; that is, the decision how much resources to extract and of those extracted, how much to spend and how much to save. And the third is the composition of government spending; that is, how much to dedicate to building each of the key components of national wealth (human, physical, and institutional capital) and how much to dedicate to current outlays.

While every government needs to consider fiscal policy along these three dimensions, the decision is especially important in resource-rich countries. Natural resources create substantial economic volatility that could lead to substantial shifts in the structures of economies towards non-tradable sectors (Dutch disease), and they can give rise to vested interests that dominate decisions about government spending to the detriment of the public.

Fiscal policy has been pro-cyclical in the resource-rich countries of Africa, as it has been in many resource-rich developing countries. A recent study confirmed that fiscal policy has had a pro-cyclical bias across developing countries and despite efforts to strengthen institutions and understand the mechanisms through which such policy can destabilize the economy, the bias has not decreased in recent years (Bova et al, 2016). Several countries, including some of the large resource-rich MICs in Africa, have introduced fiscal rules and sovereign wealth funds to manage the impact of resource volatility on spending and domestic demand. Nevertheless, these rules have done little to reduce fiscal pro-cyclicality and government spending was no less volatile in these resource-rich countries than in those without such formal fiscal rules.

Countries that rely to a larger extent on commodity-related revenues have seen a more pronounced deterioration in their fiscal balances (Danforth, Medas, and Salins 2016). Both during the 2008–09 crisis and at the end of the commodity super-cycle in 2014, the resource-rich countries introduced discretionary fiscal stimulus. Overall, however, the stimulus was too modest and did not help shift fiscal policy to a counter-cyclical stance. In 2008–09, some additional spending was possible due to the fiscal space built earlier, either enhanced by debt forgiveness or by recently gained market access. As prices for commodities increased, however, the countries did not replenish their fiscal buffers. When prices fell after 2014, buffers were much thinner and fiscal space more limited. As a result, additional spending was financed by higher government borrowing.

Procyclical fiscal policies are harmful for nations' economic health. They exacerbate macroeconomic volatility, multiply the impact of commodity prices on the economy—rather

than moderate it, result in inefficient government spending, and prevent firms and individuals from productively allocating their resources over time. The economic literature documents that terms of trade shocks have a significant negative effect on growth for countries that have procyclical government spending (Fatas and Mihov, 2003 and 2013; Dessus, Diaz Sanchez and Varoudakis, 2013; Brueckner and Carneiro, 2017). Angola and Nigeria provide apt examples of the damages caused by procyclical policies and we discuss them in some detail below.

Strengthening fiscal policy to ensure its counter-cyclicality is therefore essential for limiting the impact of resource price volatility on government spending. Depending on the state of countries' institutional development and capacity, emphasis on proper budget frameworks linked to priorities, better public finance management, and increased transparency are essential for a more predictable fiscal policy. Fiscal rules are an option and in many countries around the world—typically countries with stronger institutions—they have served as an anchor for policy, expectations, and discussions within the government and within society. Appropriate fiscal rules always take a lot of time to design and implement, however.

Fortunately, the same way commodity riches are neither a curse nor a destiny, fiscal policy in resource-rich developing countries is not destined to be pro-cyclical. There are successful resource-rich economies that have found the way to make a "switch." Since the start of the 21st century, "about one-third of developing countries have managed to switch from being procyclical to countercyclical in terms of both monetary and fiscal policy" (Vegh and Vuletin 2016).[12] Chile is an oft-quoted example of a country that, through trial and error over many years, improved its fiscal framework and introduced a workable fiscal rule to move from pro-cyclical to counter-cyclical fiscal policy.

In summary, Africa's resource-rich countries need to focus on broad counter-cyclical fiscal policies while strengthening the institutions of budget design and prioritization of spending, public investment management, budget execution, and accountability, _inter alia_. Efforts to strengthen government capacity need to continue along with measures to strengthen domestic revenue mobilization and encourage private sector development.

Procyclicality in Resource-Rich SSA

In most resource-rich SSA countries, fiscal policy was procyclical during the recent commodity boom and bust. Correlations between real public spending and real commodity exports were positive and significant in Angola, Nigeria, and South Africa (Figure 25). Monetary policy was also procyclical, given the fiscal dominance in many resource-rich SSA countries. After the commodity bust, exchange rates depreciated, particularly in Nigeria and Angola, inflation then spiked, with policy rates rising in all three countries (Figure 26).

The difficulties of operating fiscal institutions effectively encouraged the resource-rich economies to accumulate debt. In the top 10 resource-rich SSA countries there is a positive

---

12   Vegh, Carlos and Guillermo Vuletin. 2016. To be countercyclical or not? That is the question for Latin America. https://voxeu.org/article/be-countercyclical-or-not-question-latin-america

Figure 25. Real Public Spending and Real Commodity Exports, Angola, Nigeria, and South Africa, 2000–14

Angola
real government final consumption expenditures

real commodity exports, correlation=0.5228, significance level:1%

Nigeria
real government final consumption expenditures

real commodity exports, correlation=0.4656, significance level:1%

South Africa
real government final consumption expenditures

real commodity exports, correlation=0.6551, significance level:1%

Source: WDI, World Bank.

Figure 26. The Effects of Exchange Rate Adjustment on Inflation and Policy Rates

Exchange rate
LCU per US$

AGO   NGA   ZAF

Inflation
percent change

AGO   NGA   ZAF

Policy interest rate
percent

AGO   NGA   ZAF

Source: WEO and IFS, IMF (2017) and WDI, World Bank (2017).
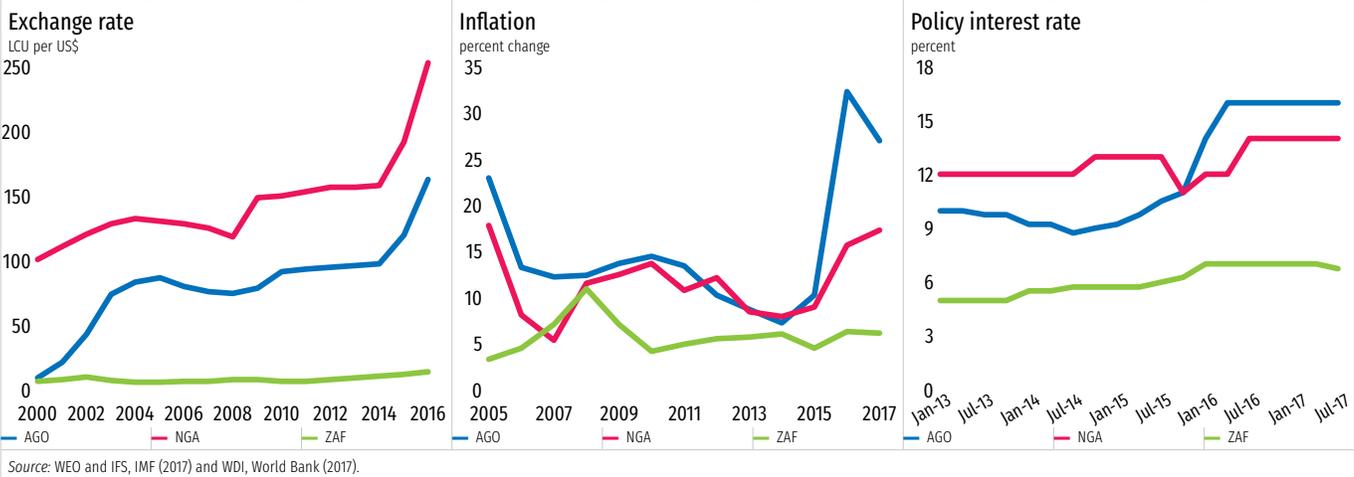
Figure 27. Primary Balances and Borrowing, 2010 – 14

a. Top 10 resource-rich countries
gross debt, 2015–16, percent of GDP

primary balance, percent of GDP

b. Top 10 resource-poor countries
gross debt, 2015–16, percent of GDP

primary balance, percent of GDP

Sources: WEO.
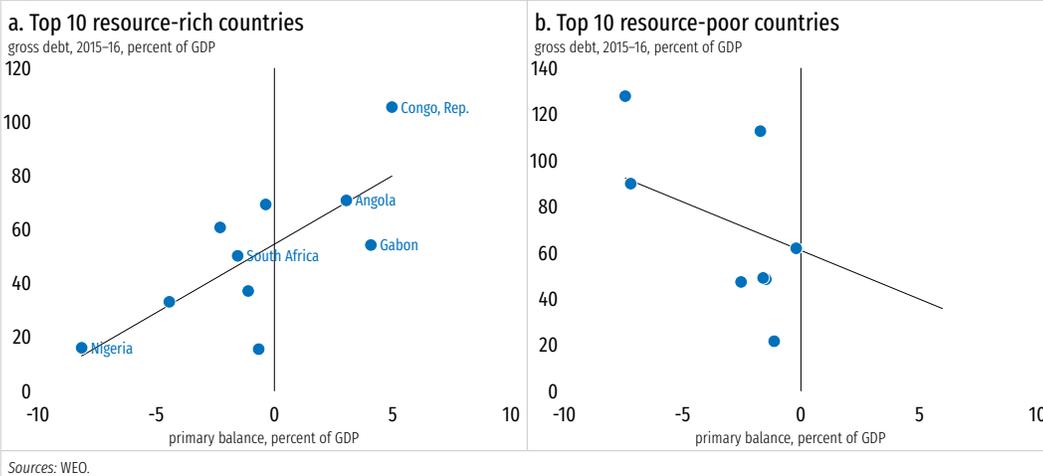
correlation between primary fiscal balances before the 2014 collapse in commodity prices and gross borrowing after the crisis. Meanwhile, higher primary balances in resource-poor African countries were correlated with lower gross borrowing after 2014 (Figure 27). Of the resource-rich countries, Republic of Congo, Gabon, and Angola relied the most on post-crisis borrowing, even though in 2010–14 they had large positive primary balances.

Figure 28. Drivers of Domestic and External Balances, 2010–14 and 2015–16

a. Domestic balance
percent of GDP

Primary balance | Revenue | Expenditure

b. External balance
percent of GDP

Current account balance | Exports, percent change | Imports, percent change

Source: IMF WEO.
Note: Unweighted.
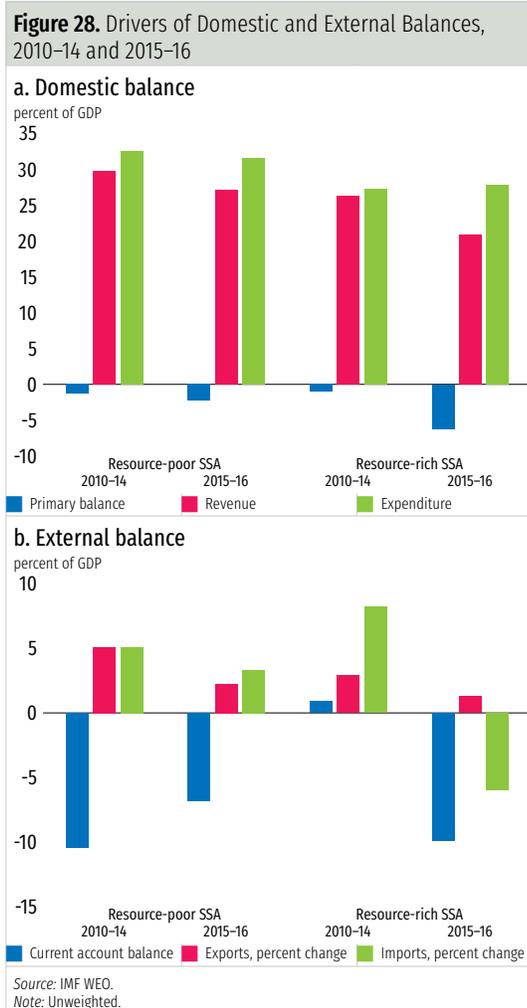
Public finances in SSA's resource-rich countries were at the mercy of volatile commodity prices. While many countries have found fiscal rules to help strengthen accountability, transparency, and ultimately the overall quality of fiscal policy, the literature on the effectiveness of fiscal rules shows that in developing countries, they often result in lower transparency and accountability as policy makers resort to distortionary policies to bypass them (e.g., using off budget spending, guarantees, financial and non-financial SOEs for quasi-fiscal activities). The literature indicates that the negative impact of fiscal rules is more likely to arise when implemented in countries with low governance and institutional quality (Alesina and al. 2008, among others). Resource-rich SSAs are at the bottom of such global rankings, which explains that the rules were not enforced when needed the most. As a result, the primary balances of these countries deteriorated because the collapse of revenues was not offset, even partly, by drawing on their resource funds (Figure 28). Similarly, on the external side, the steep drop in commodity exports caused their current accounts to deteriorate rapidly between 2010–14 and 2015–16.

It is worth noting that setting up fiscal rules and the supporting fiscal institutions is a deliberate process that requires substantial effort, political commitment, and experimentation. Many countries with successful fiscal rules today have struggled through the years to properly set them up, calibrate them, revise them as needed, and support them with the appropriate institutions. Chile, a country whose fiscal rule has been singled as an excellent example for resource-rich countries worldwide, has learned how to set up its fiscal architecture the hard way, through trial and error. In the EU, fiscal rules at the supranational and national level have undergone years of refinement—and the supranational rules still leave a lot to be desired. In Russia, the authorities introduced a rule in 2008, replaced it in 2013, and then with a third one in 2017. In SSA given the rapid build-up in debt, it would make sense to consider using part of the commodity windfalls to pay down debt, which would have a double stabilization effect: sterilize some of the windfalls to shield the economy against boom-bust cycles, while at the same time creating some fiscal headroom to maintain the country's long-term investment path.

The case of Angola

Angola's fiscal stance has been strongly procyclical despite the introduction of a fiscal rule ten years ago intended to deliver the opposite results. Following the 2008–9 global financial crisis, the government introduced a fiscal rule and the Oil Price Differential Account. All oil revenues collected by the government in excess of revenues based on the oil price assumed in the budget should be directed to the reserved account of the treasury. However, the budget assumed oil prices to maximize infrastructure spending, delivering a large pro-cyclical capital outlays surge. This pro-cyclical stance helped boost growth to 4.8 percent a year on average during 2010–14, but left the country without the needed fiscal buffers to smooth out government spending when oil prices crashed in 2014–2015. Real growth sharply decelerated to 3 percent in 2015 before output contracted by 0.8 percent in 2016.

The case of Nigeria

Nigeria is very dependent on both volatile export earnings and government revenues from the petroleum sector. Recently, the sector was responsible for 80-90 percent of Nigeria's exports and three-quarters of government revenues. The government adopted an oil price based fiscal rule designed to de-link spending from oil revenue volatility, setting oil price assumptions for the federal, state, and local government budgets. When prices are higher than assumed, the additional revenues are supposed to fill the Excess Crude Account, as they did in the early 2000s. When prices fell in 2008-09, the fund was used to bolster spending. But when prices rose again in 2010, the authorities did not replenish the fund, leaving the fiscal buffers thin ahead of the crash in oil prices and production in 2014, forcing the government to implement a fiscal contraction when the economy was also weakening.

This episode reveals two flaws with the setup of Nigeria's fiscal policy. First, the oil price assumption is much affected by politics during the budget cycle. And second, the fiscal rule omits the crucial variable of oil production from the analysis. Budgets are based on technical production capacity, which ignores disruptions from the militancy in the Niger Delta, or from the OPEC production quotas. Thus, after 2009, the budget oil price was below the actual export price, even as production fell short of anticipated amounts and buffers were not rebuilt.

Lower oil export revenues and drastic cuts in expenditures led to Nigeria's first recession in 25 years in 2016, when GDP fell by as much as 1.6 percent after increasing 5.7 percent a year on average in 2010–2014. Government revenues collapsed to about 5 percent of GDP in 2015–17, while spending was cut to about 10 percent of GDP. Deficit financing mainly through domestic borrowing led to a significant increase in the interest burden, which now absorbs three-fourths of federal government revenues. State and local governments, with stricter borrowing constraints than the federal government, resorted to the accumulation of arrears on current spending, including salaries. Fiscal retrenchment hit capital spending the hardest. The federal government's capital spending fell to 0.6 percent of GDP in 2016 before recovering modestly to 1 percent in 2017. The latter is less than half of the level of the capital budgets at the beginning of the 2010s. Sudden, unanticipated cuts in capital spending lead to

higher costs of infrastructure provision, because construction projects stand idle over years of low funding ability, and may be abandoned altogether when government priorities shift.

The Volatility of Revenues and Expenditures

Government revenues of the resource-rich countries have trailed those of the resource-poor countries in recent years. General government revenues in the resource-poor countries spiked temporarily in 2008 because of higher grants from abroad and then benefitted from more effective tax collections. Revenues in the resource-rich countries have declined with the drop in commodity prices. By 2016 general government revenues of the resource-rich countries were nearly 8 percent of GDP lower than those of the resource-poor (Figure 29).

Spending by resource-rich SSA countries has been substantially lower than that by the resource-rich. For 2000–07, resource-poor spending-to-GDP ratios plateaued at about 30 percent over 2000–07, then jumped to 33 percent in 2008–11 before returning to 30 percent (Figure 30a). The ratio followed the same trend for both groups except on two occasions: in the aftermath of the 2009–11 recession and since the collapse of commodity prices in 2014 (Figure 30b). Spending rose after the crisis in the resource-poor group, as countercyclical policy would recommend, but declined procyclically in the resource-rich group. Similarly, since 2014 spending has been little changed in resource-poor countries but has collapsed, procyclically, in resource-rich ones, reinforcing rather than ameliorating the decline in activity.

Resource-rich SSA countries seem to have adjusted to lower commodity prices mainly by cutting public investment by an average of about 3 percent of GDP from 2013 to 2015. That brought their public investment to the level of the resource-poor in recent years (Figure 31). However, the public wage bill went up in the resource-rich group as they expanded public employment when

Figure 29. General Government Revenues, Resource-Poor and Resource-Rich SSA Countries, 2001–16

percent of GDP

Source: IMF GFS and WEO.

Figure 30. Public Spending, Resource-rich and Resource Poor SSA, 2001–17

a. Public expenditure
percent of GDP

b. Public expenditure index
2000=100

Source: IMF GFS database, IMF.
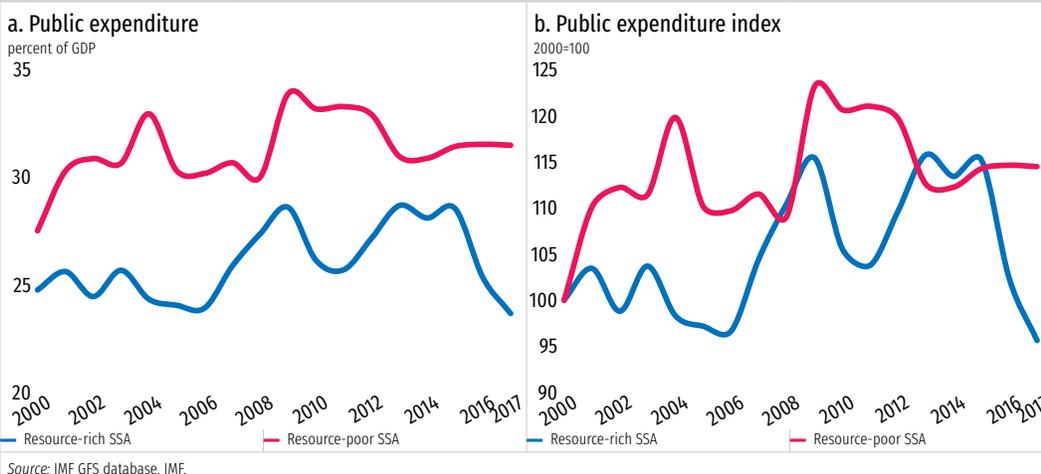
Figure 31. Government Capital and Current Spending, 2001–17

a. General government investment
percent of GDP

■ Resource-rich SSA   ■ Resource-poor SSA
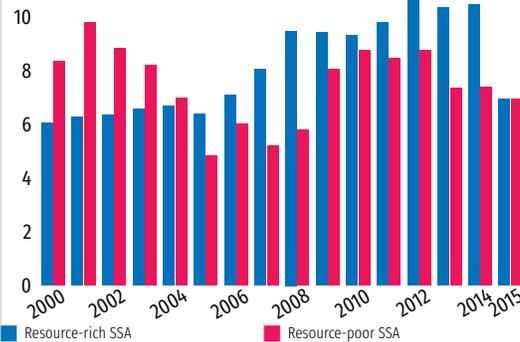
b. Compensation of government employees
percent of GDP

■ Resource-rich SSA   ■ Resource-poor SSA
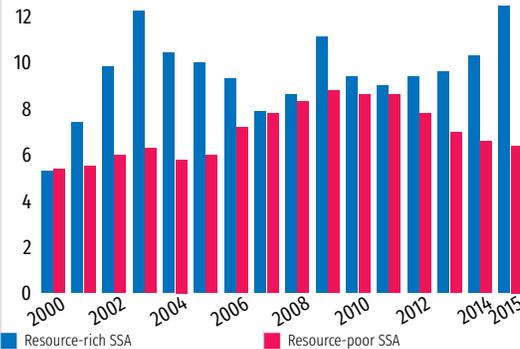
Source: IMF Investment and Capital Stock Dataset, 2017 and IMF Government Compensation and Employment Dataset, 2016.
Note: Compensation of government employees is an indication of current spending.

Figure 32. Government Debt, 2001–16

percent of GDP

— Resource-rich SSA   — Resource-poor SSA
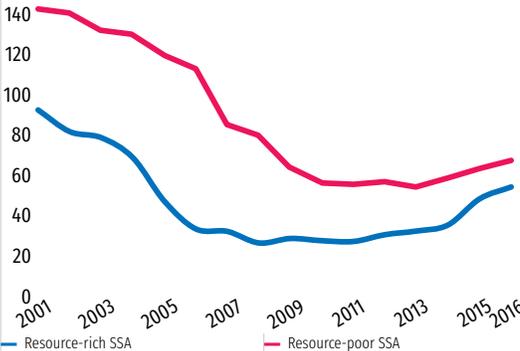
Source: WDI, World Bank.
Note: Unweighted.

the prices of resources went down, partly to absorb unemployed or partially-employed nongovernment employees. Meanwhile, both public investment and compensation of government employees decreased in resource-poor SSA countries.

Public Debt and Vulnerabilities

After decreasing for a decade, debt among the resource-rich countries of the subcontinent started to rise anew. Resource-rich debt had shrunk from about 100 percent of GDP in 2000 to less than 30 percent in 2008 with the help of debt relief initiatives (Figure 32). From the late 1990s through the 2000s, 30 African low-income countries benefitted from more than $100 billion in debt relief provided by the Highly Indebted Poor Country (HIPC) and the Multilateral Debt Relief Initiatives.

But the median public debt of the resource-rich countries went up by 22 pp from 2012 to 2016 as the commodity price boom ended and fiscal positions deteriorated. The debt dynamics were particularly bad for oil exporters. Angola and Gabon saw their debt levels more than double, and the debt-to-GDP ratio of the Republic of Congo more than tripled. When 2016 ended only Nigeria had kept its debt below 20 percent of GDP.

The structure of debt has also changed. Across the continent, the share of concessional debt has declined, replaced by borrowing from nontraditional, non-OECD, and multilateral lenders. The share of short-term debt has risen since 2011 in the resource-poor countries (Figure 33).

The fast and broad-based accumulation of debt since 2013 and increasing exposure to market risks raises concerns about debt sustainability. The number of SSA countries at high risk of debt distress, based on the Low-Income Country (LIC) Debt Sustainability Framework has more than doubled since 2013 to 15 in 2018 (World Bank 2018). Delayed fiscal adjustment will be adding to macroeconomic vulnerabilities just as countries need to refocus their energies on building capital to ensure stronger and sustainable growth.

Figure 33. The Structure of Africa's Debt, 2001–16

a. Consessional external debt

percent of total debt

■ Resource-rich SSA   ■ Resource-poor SSA

b. Short-term debt

percent of total debt

■ Resource-rich SSA   ■ Resource-poor SSA

Source: World Bank 2017, Cross-country database of fiscal space
Note: Unweighted.
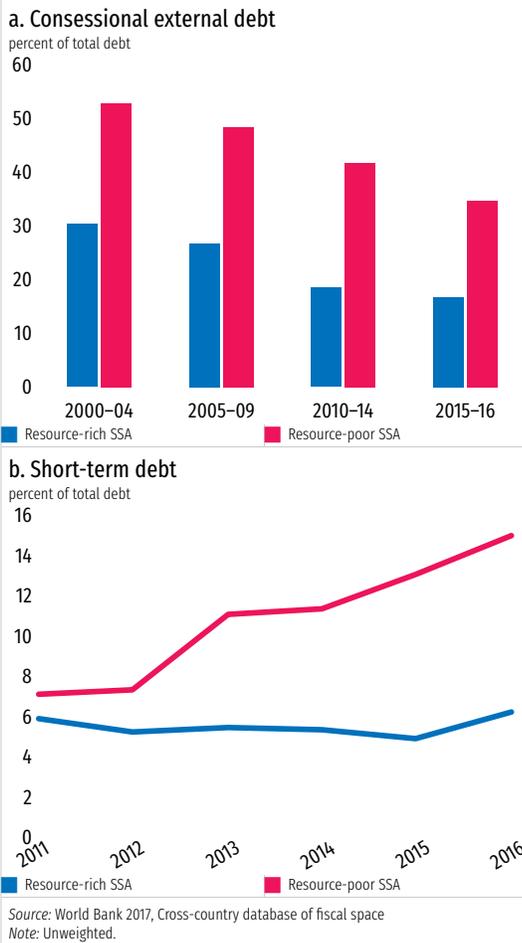
Governance Challenges in Managing Resource Volatility

Several resource-rich SSA countries set up fiscal rules to help manage volatility but few used them effectively during the recent boom and bust cycle. Angola, Botswana, and Nigeria have both fiscal rules and savings, stabilization, and sovereign wealth funds (SWF). Equatorial Guinea has a fiscal rule and Gabon and Equatorial Guinea both have sovereign wealth funds (Table 1). However, these fiscal instruments have not been very effective. Consider Angola: Angola set up the Oil Price Differential Account (FDPP), the Strategic Financial Oil Reserve for Infrastructure, and an SWF, with the FDPP serving as a buffer in bad times (IMF 2015). But the authorities have yet to establish clear guidelines linking the fiscal rule to guidelines on the amounts the government can withdraw from the funds. At present, the president must authorize withdrawals. As a result, Angola resorted to borrowing during the bust, pushing up its debt.

Nigeria introduced fiscal responsibility legislation in 2007 and has both fiscal rules and savings, stabilization, and sovereign wealth funds. During the global recession, the authorities adhered to the fiscal rules, drawing on the Excess Crude Account (ECA), which helped limit the impact of the crisis on the economy. But the ECA was not replenished later when oil prices were higher, and by the time commodity prices tanked in 2014, the fiscal buffers were depleted. Thus, in Nigeria, institutional arrangements did not prevent procyclical fiscal policy during the recent boom and the therefore inevitable bust.

Table 1. Resource Funds and Fiscal Rules, Selected Resource-rich SSA Countries

	Fiscal Rule		Saving Fund		Stabilization Fund		SWF		Assets USD billion
	Yes/No	Year of Implementation	Yes/No	Year of Implementation	Yes/No	Year of Implementation	Yes/No	Year of Implementation	
Angola	Yes	2010	Yes	2012	Yes	2012	Yes	2012	4.6
Botswana	Yes	2003	Yes	1993	Yes	1972	Yes	1994	5.5
Congo, Rep.	No		No		No		No		
Equatorial Guinea	Yes		Yes	2002	No		Yes	2002	0.08
Gabon	No		Yes	1998	No		Yes	1998	0.4
Nigeria	Yes	2007	Yes	2011	Yes	2004	Yes	2012	1.4
South Africa	No		No		No		No		
Sudan	No		No		Yes	2002	-	-	-
Tanzania	No		No		No		No		
Zambia	No		No		No		No		

Source: Lledo et al. (2017); FAD Fiscal database, World Bank (2017) and SWF Institute (2017).

The Extractive Industries Transparency Initiative (EITI) was set-up by governments, companies and other partners to help provide transparent and timely information about countries' extractive sectors. The EITI has 51 member-countries; of these, 24 are from SSA. Four of the top 10 resource-rich SSA countries are members of the EITI: Nigeria, Republic of Congo, Tanzania and Zambia.[13] Nigeria, Tanzania and Zambia have made "meaningful progress" towards meeting the 2016 EITI standard.

Several empirical studies suggest that the EITI has a positive impact on government effectiveness, regulatory quality, and economic development (Corrigan, 2014). The experiences from the EITI in Tanzania show that the improved transparency in revenue collections also lead to improved government revenues (Tanzania SCD, 2017). In the Republic of Congo, the EITI has contributed to strengthening government transparency on revenues from the extractive industries even though there is a need for more transparency and better management of the resource rents (World Bank, 2015).

A Fiscal Rule Primer: the Case of Chile[14]

Prior to the introduction of its fiscal regime at the start of the 21st century, Chile had suffered from a seemingly endless succession of mining booms and busts. However, starting in 2001, the Chilean Ministry of Finance adopted a structural balance rule, which limited the effects of cyclicality on fiscal management (mining revenues are in the order of 15 percent of total revenues) and improved the weak public finances seen in the late 1990s. These weaknesses included a series of fiscal deficits, the negative net worth of the Central Bank (undermined by a large bailout of insolvent banks in the 1980s and FX operations in the 1990s), foreign debt vulnerabilities, and the large contingent liabilities associated with pensions and infrastructure concessions.

The new fiscal regime was needed to neutralize the fluctuations, but also had to be simple, clearly defined and transparent, to provide maximum clarity on the fiscal situation and avoid manipulation. The source of the fluctuations on fiscal revenues was threefold. First, whenever copper (and molybdenum) prices went up, mining tax revenues went up. To neutralize the fluctuations, a long-term copper price projection was used, instead of the actual price, to determine the "structural" mining revenues. If the actual mining price went above the long-term price projection, the realized revenues would be saved, and not used in the current budget, and vice versa. Second, whenever GDP fluctuated, non-mining tax revenues fluctuated. To neutralize this, a long-term GDP growth rate was estimated, and, similar to the mining tax revenue smoothing, a structural non-mining tax revenue stream was created. Third, the return on governments' financial assets fluctuated also, and a similar smoothing mechanism was adopted. In each year, the "structural" (not the actual) revenues would then set a limit on actual expenditures in such a way that a specific fiscal balance would be achieved.

---

13   The other SSA members are Burkina Faso, Cote d'Ivoire, Cameroon, Central African Rep, Chad, Democratic Republic of Congo, Ethiopia, Ghana, Guinea, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone and Togo. Equatorial Guinea and Gabon were formerly members and have been delisted.

14   Based on the discussion of the fiscal rule on the web site of the Ministry of Finance of Chile and in the Mongolia Economic Monitor, https://www.mongolbank.mn/documents/moneypolicy/worldbank/2009-09e.pdf

The budget balance thus targeted is therefore called a structural balance. Chile started out with a structural surplus of 1 percent of GDP. During the mining boom years of the mid-2000s, this type of structural balance rule was in place. Chile's actual fiscal surpluses would grow to 8 or 9 percent of GDP, but expenditures would be limited as if the surplus were only 1 percent. The structural balance target is reviewed every year, and in the case of Chile I tis flexible—it can be changed by the government at any time while specifying when it will return to normal by following prescribed procedures. This is indeed what the government did. The surplus was reduced to 0.5 percent of GDP in 2008 after the introduction of the 2006 Fiscal Responsibility Law and further to nil, or balance, in 2009 to help manage the impact on Chile of the global financial crisis.

The rule is supported by robust institutional arrangements. An independent committee sets the parameters for trend GDP that underpins the budget framework and a separate committee provides the medium-term projection for copper prices. The 2006 Fiscal Responsibility Law formalizes the institutional set-up, including by requiring that only the President can take fiscal initiatives that the parliament can either approve or reject. Parliament cannot increase revenues or spending in the draft budget—it can only reduce expenditures.[15]

---

15   Dabán, Theresa. 2011. Strengthening Chile's Rule-Based Fiscal Framework. IMF WP 11/17.

4. Physical and Human Capital, and Institutions

Setting resource-rich Africa on a path of much stronger, sustainable, and inclusive growth will depend on its success in boosting human and physical capital, building up institutions—and seeking additional natural resources. Africa's current levels of capital and current policies are not adequate to support a pace of growth that will allow for faster increases in living standards, reduction in poverty, and accelerating convergence both with other developing regions and with advanced economies. Governments need to make the business environment more attractive and de-risk their economies to boost fixed investment. Efforts to expand access to education need to be enhanced by a drive to raise learning outcomes.

Underlying these policies should be determined efforts to reinforce institutions so that they can open opportunities for both individuals and companies. One large untapped resource is the still-negative rate of adjusted net saving. Raising that rate to the level of resource-rich OECD countries by improving governance and markets will be equivalent to injecting an additional $77 billion into the economies of resource-rich Africa—an amount more than twice the annual magnitude of the combined inflows of FDI and remittances received.

Africa's Produced Capital

The level of capital in resource-rich Africa is low. On average physical capital per person in resource-rich SSA is like that of South Asia—but in both sets of countries, natural and produced capital trail the levels in LAC. As for human capital, the level in resource-rich Africa is just one-fourth that in MENA (Figure 34).

Figure 34. Capital by Region, Constant 2014 Prices

US dollars per capita, in thousands

Legend: Natural capital, Produced capital, Human capital

Source: WDI, World Bank.
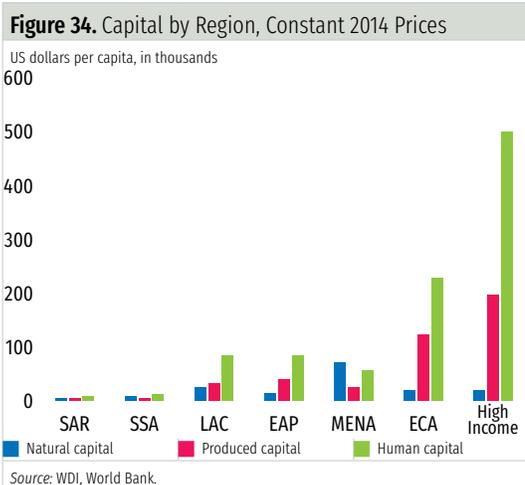
Table 2. Quantity of Infrastructure, Developing Regions

	Railways, total km	Port Container Traffic, TEU thousands	Air passengers carried, thousands
SSA	59,634	14,152	48,920
SAR	79,583	22,727	142,493
LAC	102,460	46,023	266,631
ECA	377,384	119,543	941,578
High income	527,999	328,894	2,210,490
EAP	122,156	386,233	1,151,610

Source: WDI, http://wdi.worldbank.org/table/5.10

The stock of physical infrastructure in Africa is the lowest among developing regions. The length of railways, the capacity of container ports, and the capacity of airports serve as examples (Table 2). This applies to both resource-rich and resource-poor countries, except for South Africa.

The quality of road and port infrastructure in most of resource-rich Africa, again excepting South Africa, trails not only comparators but even the resource-poor African group. For instance, electricity supply is of better quality in resource-poor SSA countries than in resource-rich ones (Figure 35). The quality of roads and ports is relatively similar across the

Figure 35. Quality of Infrastructure, Resource-rich and Resource-poor SSA Countries, 2014

Source: Data from WEF 2014–15.
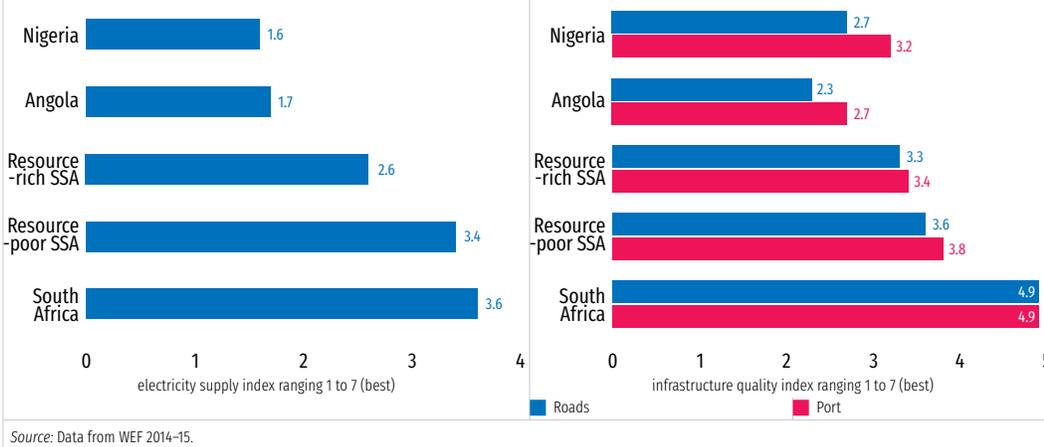
Figure 36. Access to and Cost of Electricity, Resource-rich MICS, 2014

a. Access to electricity
in percent of population

b. Getting electricity cost
in percent of income per capita

Source: Data from the Sustainable Energy for All (SE4ALL) database and Doing Business.
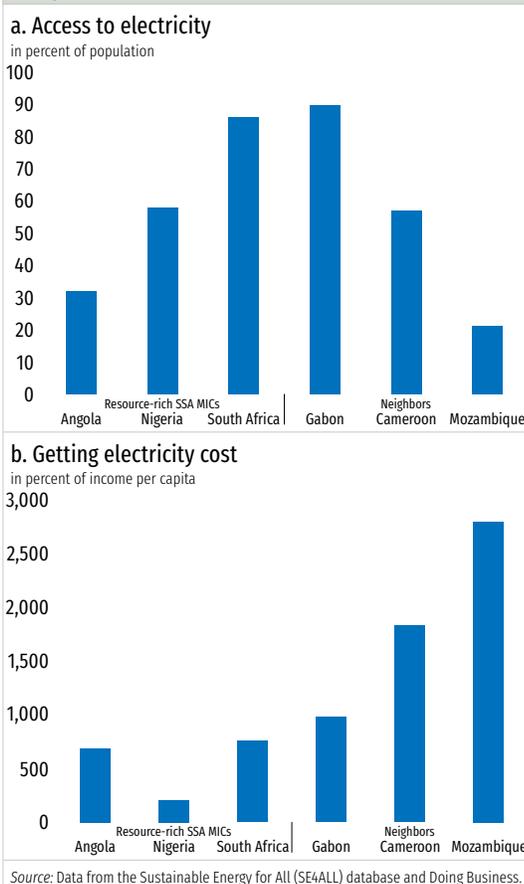
two groups of countries. Nonetheless, there is wide variety among countries. South Africa has better developed infrastructure than the other MIC SSA countries or their selected neighbors (Figure 36). Of the three MIC resource-rich SSA countries and their neighbors, the quality of roads and ports are of lesser quality in Angola.

However, access to electricity is on average better in the resource-rich countries than in the resource-poor. For instance, while 58 percent of Nigerians have access to electricity, only 21 percent of Mozambicans do (Figure 40). The cost of getting electricity in Mozambique is more than five times higher than in Angola, Nigeria, or Gabon.

SSA has improved its access to education, with resource-rich countries making more progress than the resource-poor. However, despite their progress on access, other than in South Africa and Botswana, average years of schooling in the resource-rich group are still low (Figure 37).

While access has improved, the quality of education outcomes has not. Less than one-fifth of SSA primary school students score above the minimum proficiency in mathematics and reading (Figure 38). The most recent World Development Report on education shows that in Ghana, as in India, 80 percent of second-grade students cannot read a single word. In West and Central Africa, Cameroon is the only resource-rich country to score better in reading than the average PASEC (*Programme d'Analyse des Systemes Educatifs de la Confemen*) countries: 24 percent of the Cameroonian sixth-grade

Figure 37. Average Years of Schooling, Resource-rich SSA Countries, 2000 and 2010

total years, 2010

total years, 2000

● Resource-rich SSA   ● Resource-poor SSA   — y=x
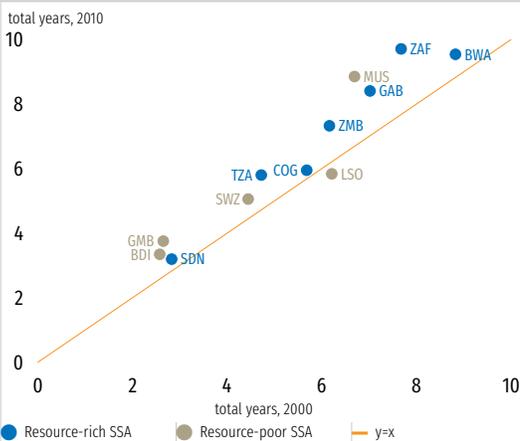
Source: Barro and Lee 2013.

Figure 38. Median Percentage Above Minimum Proficiency, Primary School Students, by Region and Income Status

percent

■ Mathematics   ■ Reading
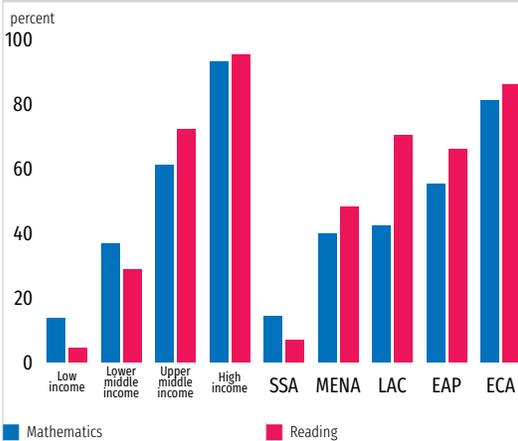
Source: World Development Report 2018.
Note: Bars show the unweighted average median within country grouping. Regional averages exclude high-income countries. India and China are among the countries excluded for lack of data. Minimum proficiency in mathematics is benchmarked to the Trends in International Mathematics and Science Study (TIMSS) assessment and in reading to the Progress in International Reading Literacy Study (PIRLS) assessment.

Figure 39. Competence of SSA Sixth Grade Students, PASEC, 2014

a. Reading

b. Mathematics

■ Not competent   ■ Low competency   ■ High competency
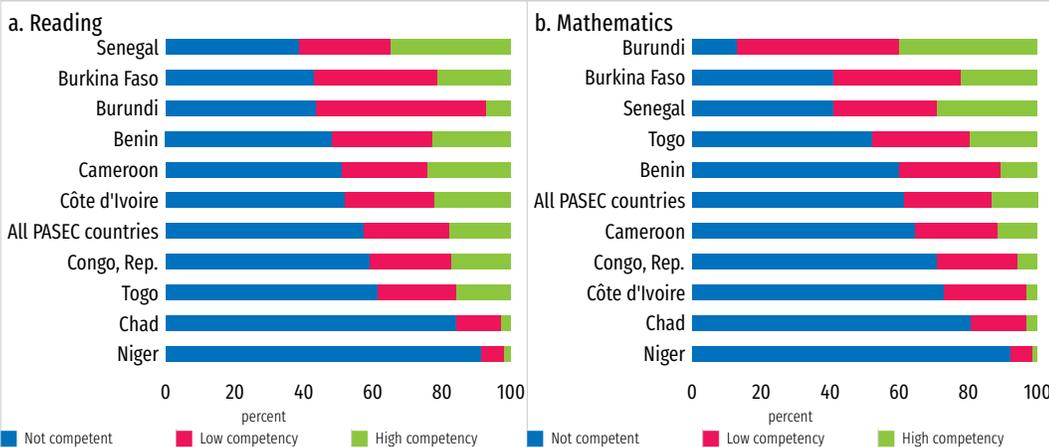
Source: WDR 2018.
Note: For the PASEC reading exam, "not competent" refers to levels 0–2 in the original coding, "low competency" to level 3, and "high competency" to level 4. For the mathematics exam, "not competent" refers to levels 0–1 in the original coding, "low competency" to level 2, and "high competency" to level 3.

Figure 40. Competence of SSA Sixth Grade Students, SACMEQ, 2007

a. Reading

b. Mathematics

■ Not competent   ■ Low competency   ■ High competency
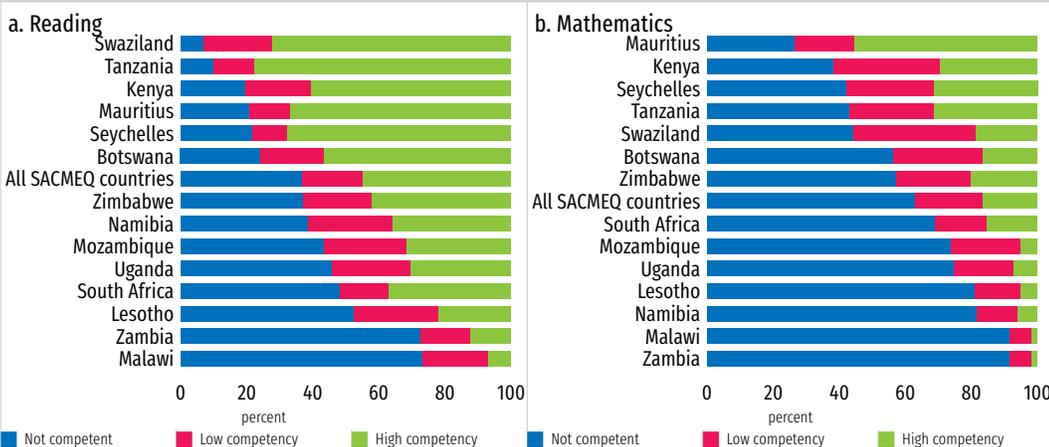
Source: WDR 2018.
Note: Not competent" refers to levels 1–3 in the original SACMEQ coding, "low competency" to level 4, and "high competency" to levels 5–8.

students had high competency in reading in 2007 (Figure 39). In Southern and East Africa, three resource-rich countries—Tanzania, Kenya and Botswana—scored above the average for SACMEQ (Southern and Eastern Africa Consortium for Monitoring Educational Quality) in both mathematics and reading (Figure 40).

Investment and Education Spending

Since 2005 investment by the top-10 resource rich African countries has been higher than 25 percent of GDP. This is higher than what was sustained for several decades by the 13 countries that the Growth Commission (2008) considered the world's sustainable growth champions (Figure 41). Investment rates have been volatile in the resource-rich group, reflecting considerable investment by the government and more subdued private investment than in resource-poor Africa. Foreign private investment in Africa accounts for just 2 percent of the world's FDI stock, with much of it concentrated in the extractive sector.

Figure 41. Fixed Investment, Resource-rich and Resource-poor Africa, 2000–17

percent of GDP

Resource-rich SSA   Resource-poor SSA

Source: IMF WEO.
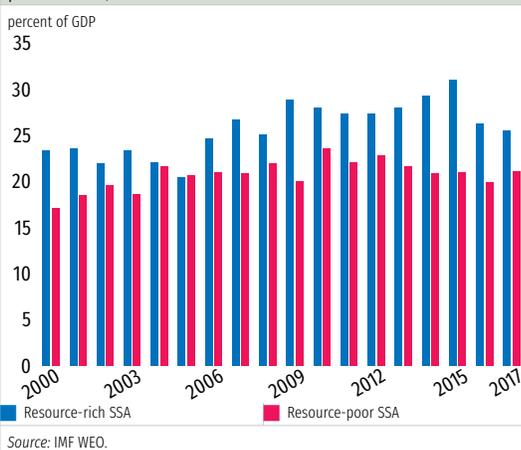
Resources can be boosted by doing more to mobilize domestic revenue, enhancing the business environment, and building up finances. However, accumulating more capital will depend on making management of public investment more efficient. A recent study (Gill et al, 2016) suggests that in developing countries, 40–50 percent of investment is wasted, and the poorer the country's institutions, the more investment is wasted.

The average spending on education in resource-rich Africa exceeds 4 percent of GDP, more than many successful economies, such as Korea and Singapore in the 1970s spent when their per capita income was close to SSA's today. Nevertheless, the averages hide three problems:

Figure 42. Average Spending on Health and Education, Resource-rich and Resource-poor Africa, 2010–14

a. Health

percent of GDP

b. Education

percent of GDP

Source: WDI database.
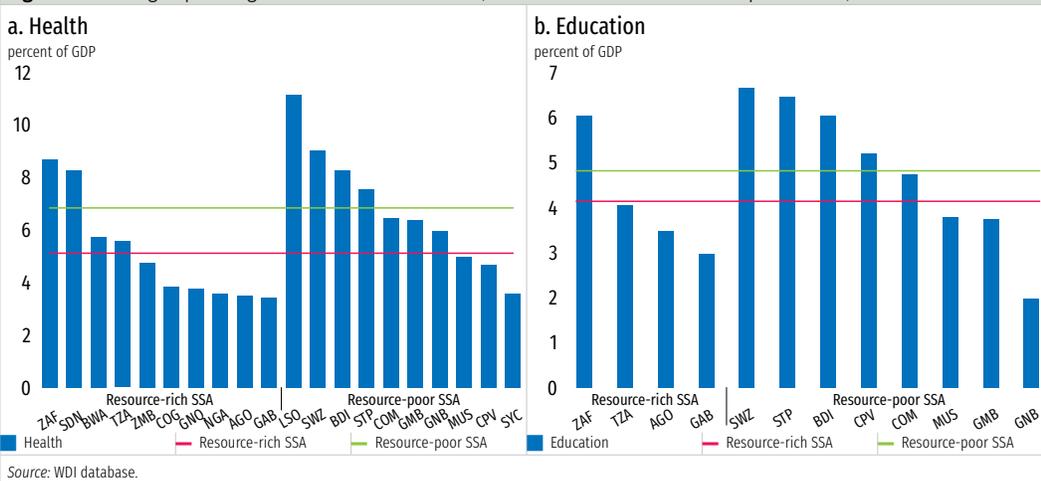
- Many resource-rich countries, such as Gabon, which has the highest natural resources per capita, and Angola spend considerably less than the average on education.
- The resource-poor SSA countries on average spend more on health and education than the resource-rich (Figure 42).
- Especially for health, spending-to-GDP ratios tell only part of the story. Investment in medical equipment is at market prices, for instance, accounting for a larger share of GDP in countries with lower incomes.

Figure 43. Governance Indicators Compared, 2014

Governance index

— Resource-rich SSA — Resource-poor SSA — Other resource-rich countries

Source: WGI, World Bank
Note: Governance indicators rank from −2.5 (weak) to 2.5 (strong).

Figure 44. Country Policy and Institutional Assessment Governance Indicators, 2017

CPIA index

Resource-rich SSA countries   Resource-poor SSA countries

■ Property rights and rule-based governance
■ Quality of public administration
■ Transparency, accountability, and corruption
■ Quality of budgetary and financial management
■ Efficiency of revenue mobilization

Source: WDI database.
Note: CPIA indexes range from 1 (low) to 6 (high).

The Quality of Institutions

The quality of institutions in the resource-rich SSA countries is substantially poorer than that in resource-poor SSA and resource-rich countries in other regions. For countries with little produced and human capital, the quality of institutions makes a profound difference in how well public services are delivered, how level the playing field is for companies, and whether opportunities can be provided for both individuals and firms. It appears from the World Bank governance indicators that resource-rich SSA countries have serious problems on all six dimensions (Figure 43). The gap with resource-rich countries outside SSA is particularly large, especially in the areas that matter most to growth: government effectiveness, rule of law, and regulatory quality.

The resource-rich SSA countries are no better governed than the resource-poor ones, according to the World Bank's Country Policy and Institutional Assessment (CPIA). The largest gaps are in property rights and rule-based governance, quality of the public administration, and quality of budgetary and financial management (Figure 44). Governance in the presence of large resource rents needs to be more efficient than in the absence of resources; at the same time, improving governance in the presence of resource rents is a most difficult challenge to overcome.

The result of governance deficiencies in resource-rich SSA is a very difficult environment for private enterprises. Most SSA countries trail other developing regions by a large margin, as measured by the distance to the frontier (DTF; Figure 45). Only SAR is ranked on par with resource-rich SSA. The top-ranked resource-rich SSA country is Botswana, ranked 81st. Yet the top SSA country is Mauritius, a resource-poor economy, which comes in at 25th. The substantial gaps between the resource-rich SSA countries and their comparators in other regions urgently require attention from policymakers. Without a level playing field, primacy of the rule of law, a business environment that allows companies to thrive, and

Figure 45. SSA and the Doing Business Indicators, 2017
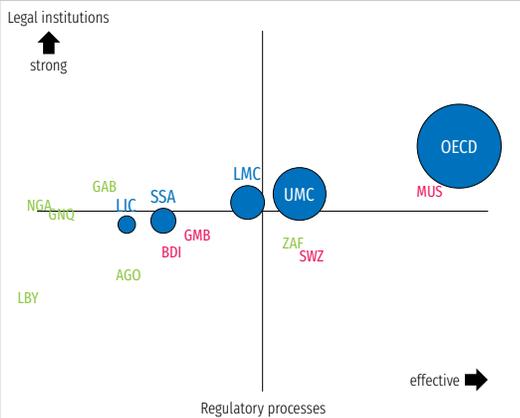
Source: World Bank *Ease of Doing Business 2017.*
Note: "Strength of legal institutions" refers to the average ranking on getting credit, protecting investors, enforcing contracts, and resolving insolvency; "complexity and cost of regulatory processes" is the average ranking on starting a business, dealing with construction permits, getting electricity, registering property, paying taxes, and trading across borders. LIC: Low income countries; LMC/UMC: Lower/Upper middle-income countries, respectively. Countries in green are resource-rich and countries in red are resource-poor SSA countries. Horizontal axis: minimum=40; maximum value=90. Vertical axis: minimum=0; maximum value=90. DTF (distance to frontier) is reflected on a scale from 0 to 100. The DTF measure shows the distance of each economy from the "frontier"—the best performance observed on each indicators of all economies in the Doing Business sample since 2005.

Figure 46. Adjusted Net Saving, Resource-Rich SSA and Comparators, 1997–2015

a. Selected regions

b. Selected resource-rich SSA countries

Source: World Bank Changing Wealth of Nations database.
Note: The variable used is net adjusted savings, including particulate damage (percent of GNI).

governments that deliver the public services needed to build human and physical capital, prospects for resource-rich Africa will be dim.

Putting it All Together

In resource-rich SSA, over the last two decades the adjusted net savings rate—the efficiency of converting natural resource rents into produced capital—has improved substantially. Although still just below nil, the average is up from a negative 10 percent in 1997, a remarkable improvement (Figure 46). This compares with a relatively steady positive 8 percent average in resource-rich OECD countries and a 2.5 percent positive average in resource-rich Eurasia. Resource-rich SSA has more to do to improve efficiency, but the steady advances it has already made should support further progress.

There are substantial differences in the adjusted saving rates of the individual resource-rich economies. The average rate for Botswana, Tanzania, and Zambia is almost 20 percent; those of Nigeria and South Africa have oscillated near zero; that of the Republic of Congo is a negative 30 percent; and Angola's is a negative 40 percent. The rates are substantially negative for the oil-rich countries (average 22 percent) and strongly positive for the other resource-rich countries (13 percent on average). The differences suggest substantial inefficiencies, and opportunities.

Raising the adjusted saving rate in resource-rich SSA to OECD levels would be equivalent to generating an additional $77 billion of investment in produced capital. This is almost five times more than the annual inflows of FDI, and more than three times the annual inflows of remittances. To capture this substantial resource will require governments to improve both their institutions and their policies.
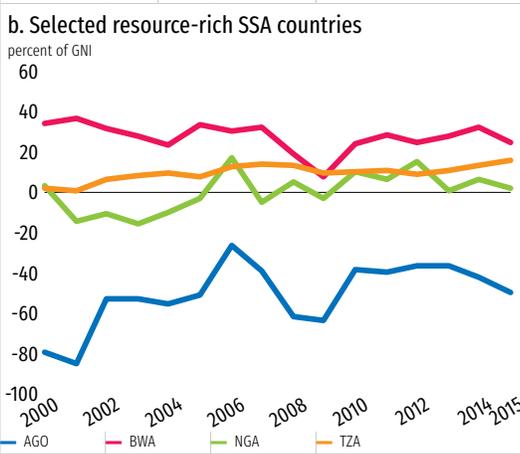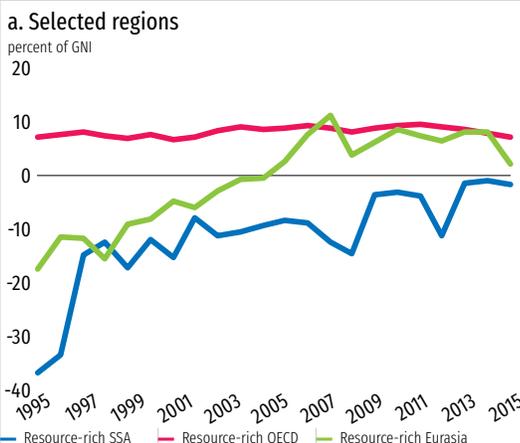
5. Spillovers and Regional Integration

Reinvigorating growth in resource-rich Africa will depend crucially on the ability of countries to integrate regionally, to overcome the burdens of low density, thick borders, and long distances. So far, spillovers from the three largest resource-rich MICs to their neighbors and the whole subcontinent have been negligible. This is a surprising finding with substantial negative implications for growth in output, exports, and incomes. Despite the exceptional potential that Nigeria, South Africa, and Angola have in bringing their neighborhoods closer, they are not yet sufficiently pulling their weight. And without strong spillover effects from the resource-rich countries to their neighbors, resource-rich Africa is not benefiting from increased demand for its non-commodity goods, services, finance, and expertise, limiting its huge opportunities.

The parallel with the first round of tigers of East Asia and the next generation of countries in that region is important. Taiwan, China, Hong Kong SAR, China and Korea, which have large populations and sizable domestic markets, integrated globally first, taking advantage of the unique international landscape in the first three decades after World War II, characterized by segmentation of countries with endowments of low-cost and high-cost labor, gradual trade integration, fixed exchange rates, and managed capital flows; dedicated U.S. investments that helped shift manufacturing to East Asia; and a robust U.S. security umbrella. For the Asian tigers, integrating regionally was not practical or feasible until the late 1970s. The next round of East Asian countries, such as Malaysia and Thailand, integrated both regionally and globally based on a consistent platform of WTO accession and taking advantage of the numerous production chains that started or ended in the tigers and then shifted to China. East Asia also benefitted from abundant low-cost labor moving out of agriculture or planning to make the transition.

The current rapid technological advances are producing a skill- and capital-biased globalization that creates unique challenges for resource-rich SSA. Global integration of the region is a must, also starting with the WTO. Regional integration needs to proceed even more forcefully because, except for Nigeria, the resource-rich SSA's countries have smaller populations, smaller markets, and smaller middle class than comparators in other regions, and attractive investment options often require scale. Opening the borders will allow for positive spillovers from the resource-rich countries of Africa to their neighbors through increased intra-industry trade in the non-resource sectors and access to more firms and households. It will also allow these resource-rich countries to create or access regional production networks besides those in commodities, generating a growth impetus. The future lies in substantially deepening regional integration, especially around the large MICs.

Figure 47. International Urbanization Rates, 1985–2016

in percent of total population

1985   2000   2016

Source: WDI database.
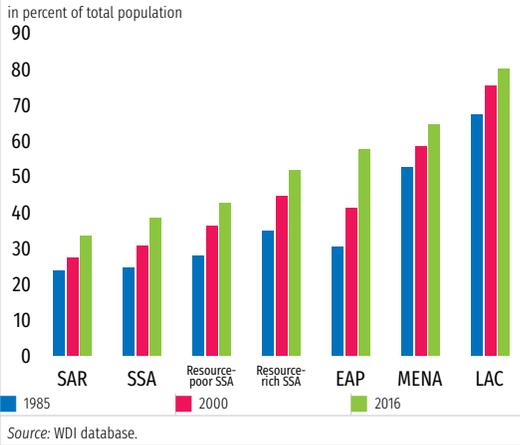
Figure 48. Agglomeration Index, 2015

Source: Based on population data in Global Human Settlement Layer (2015).
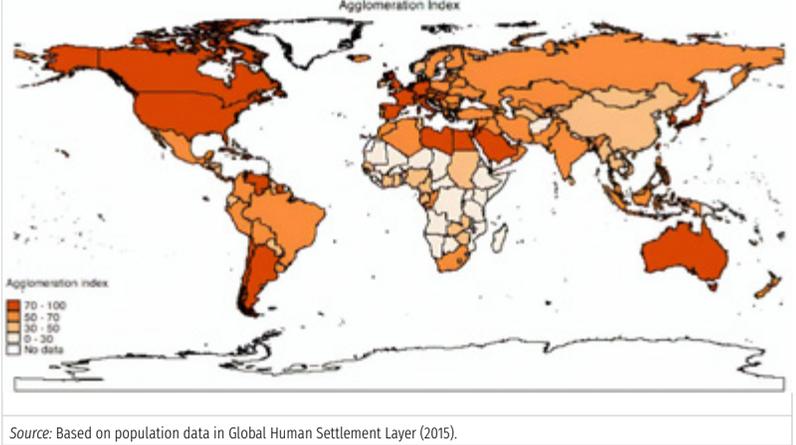
Figure 49. Agglomeration in Resource-rich and Resource-poor SSA

agglomeration index, 2015

Source: Based on population data in Global Human Settlement Layer (2015).
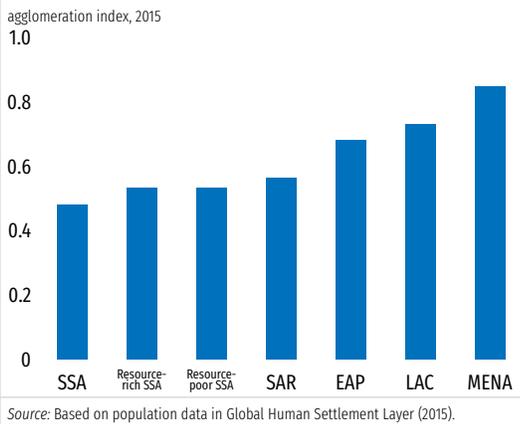
Urbanization and Agglomeration

The resource-rich countries in SSA are urbanizing rapidly; half of the population already lives in cities. This is higher than the two-fifths for SSA as a whole and the one-third for South Asia (Figure 47). Resource-rich SSA is substantially more agglomerated than the whole continent and most other developing regions (Figures 48 and 49).

Cities—densely populated areas with relatively better infrastructure—are considered channels for scale economies, internal and external. The top 600 cities of the world account for 20 percent of its population but more than 50 percent of its production.[16] There are 57 African cities with at least 1 million

Figure 50. Urbanization and Incomes in SSA

a. Urbanization rate and per capita GDP are correlated

2016 share of urban population

$y=0.002{***}x + 36.946{***}$
$R^2 = 0.1643$

2016 GDP per capita (constant 2010 US $), in thousands

SSA   Other   SSA, linear   Other, linear

b. Cities are growing, but at lower income levels

GDP per capita, 2010 US$, in thousands

Urbanization at 40%

Source: WDI and Fall and Coulibaly (2016).
Note: The coefficients and R-squared displayed in the figure are from estimations using only SSA. The *** denotes statistical significance at the 1 percent level.

---

16   McKinsey Global Institute Cityscope 1.0.

inhabitants compared with 54 cities in Europe, 41 cities in North America, and 10 cities in the United States.[17] However, aggregate numbers indicate that the correlation between urbanization and per capita GDP in Africa is weak (Figure 50). SSA can do better in delivering scale efficiencies through urban agglomerations.

Figure 51. Urban Primacy in Developing Regions Compared

urban primacy, in percent, 2016

Source: United Nations, World Urbanization Prospects.
Note: Primacy is the percentage of urban population in the largest metropolitan area.
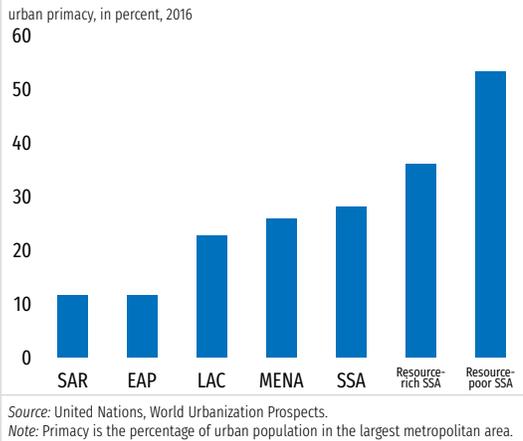
While resource-rich Africa lags in terms of urbanization, the continent's primary cities are far more dominant within their respective country than those in any other developing region. In many SSA countries, more than 30 percent of the urban population lives in the largest city; in the Republic of Congo, 58 percent of the urban population lives in the capital, Brazzaville (Figure 51). However, urbanization is not just about a single city within a country. In fact, a country's cities can be treated as a portfolio of assets, each differentiated by such characteristics as size, location, and density of settlement. Businesses and people can exploit economies of scale and agglomeration if their urban settlements perform their intended functions.

Thick Borders

Division, or economic fragmentation, impedes trade and other interaction between countries. Using an index of border restrictions as a measure, divisions between countries in SSA seem to have increased over the last decade, more so in resource-rich than in resource-poor countries (Figure 52). Borders became more restrictive in all the resource-rich countries, and

Figure 52. Borders of SSA Resource-rich Countries, 2007 and 2015
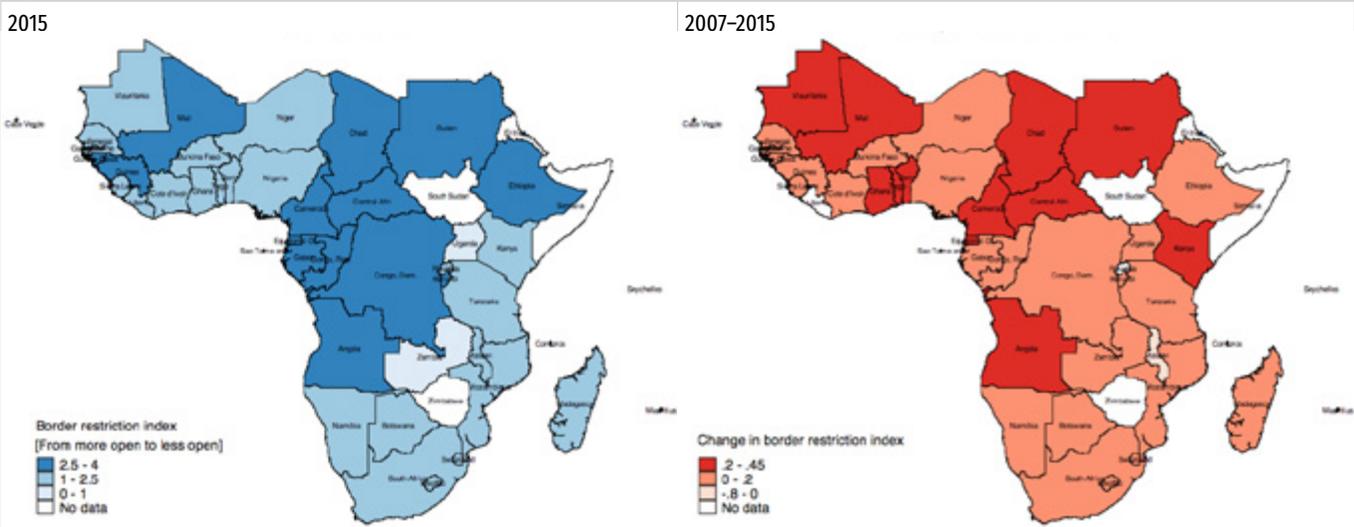
Source: Based on average tariffs (WDI), press freedom index (Reporters without Borders), and capital restriction index (Chinn and Ito, 2015), and restrictions on people (percentage of countries needing a visa to enter, Neumayer, 2006).
Note: Left chart shows the extent of border restrictions, a smaller index means thinner borders. The right chart shows the change in the border restriction index between 2007 and 2015. A darker color indicates more restrictions.

---

17   http://www.un.org/en/development/desa/population/publications/pdf/urbanization/the_worlds_cities_in_2016_data_booklet.pdf   and   UNSD Demographic Statistics.

Figure 53. Ease of Trading across Borders, Resource-rich SSA, 2018, Distance to Frontier

index
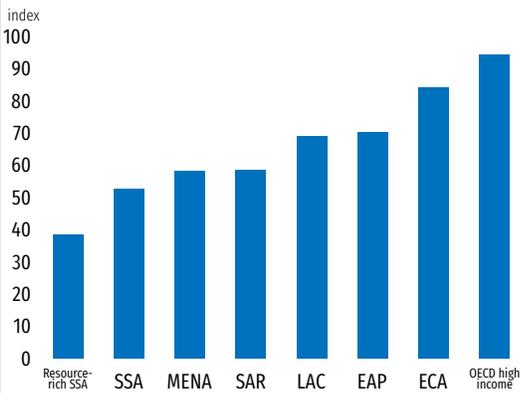
Source: Doing Business, World Bank (2018).
Note: Higher suggests closeness to the frontier.

more in Angola than in Nigeria and South Africa. Only the borders of resource-poor Malawi and Seychelles seem to be more open in 2015 than they were in 2007.

More restrictive borders in resource-rich SSA puts those countries far behind not only resource-rich countries in other developing regions but also resource-poor SSA countries. Trading across borders is more difficult in resource-rich SSA than in other regions and SSA as a whole (Figure 53). In southern Africa, Namibia and Botswana do better at trading across borders than South Africa and Angola. Similarly, the cost of exporting from resource-rich SSA is the highest among developing regions (Figure 54). Their thicker borders suggest that resource-rich SSA have less scope for trade and more limited growth spillovers, while the region has become less interconnected.

Figure 54. Costs to Export, Resource-rich SSA and Comparators, 2014 and 2018

a. Cost to export: border compliance (USD), 2018
in thousand US dollars

b. Cost to export (USD per container), 2014
in thousand US dollars
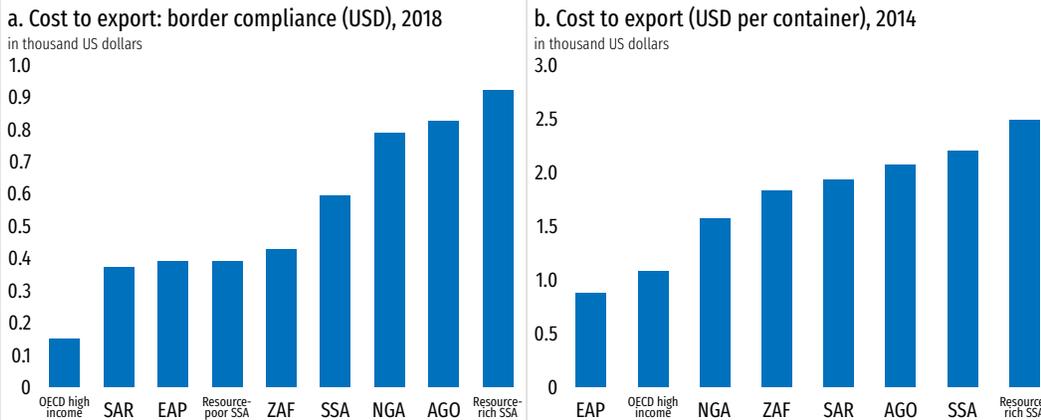
Source: World Bank Doing Business project.

Of the SSA resource-rich, South Africa has the least restrictive borders. Angola's are the least open in terms of flows of capital and ideas (Figure 55.) Average tariff rates are higher in Nigeria than in Angola and South Africa.

Income per capita is inversely correlated with border thickness. Countries that are more open to trade, ideas, and (appropriately sequenced) inflows of foreign capital are better integrated into the global economy and benefit from their interactions with other countries (Figure 56). This suggests that the thick borders around resource-rich SSA countries, especially the three large MICs, are a major deterrent to growth spillovers to their neighbors. And thick borders between resource-rich and resource-poor countries are the opposite of what trade theory would suggest for countries with complementary production and export structures. Implementing measures to drastically reduce the thickness of borders of resource-rich SSA will be win-win: more open borders will boost regional exports, create larger agglomeration economies, help attract more private investment from abroad, and bolster the growth potential of all SSA.

Figure 55. Border Restrictions, Large SSA MICs, 2015

a. Average tariffs

percent

b. Capital restriction index

index

c. Press freedom index

index

d. Border restriction index

index

- Border restriction index
- Resource-poor SSA
- Resource-rich SSA
- Other resource-rich
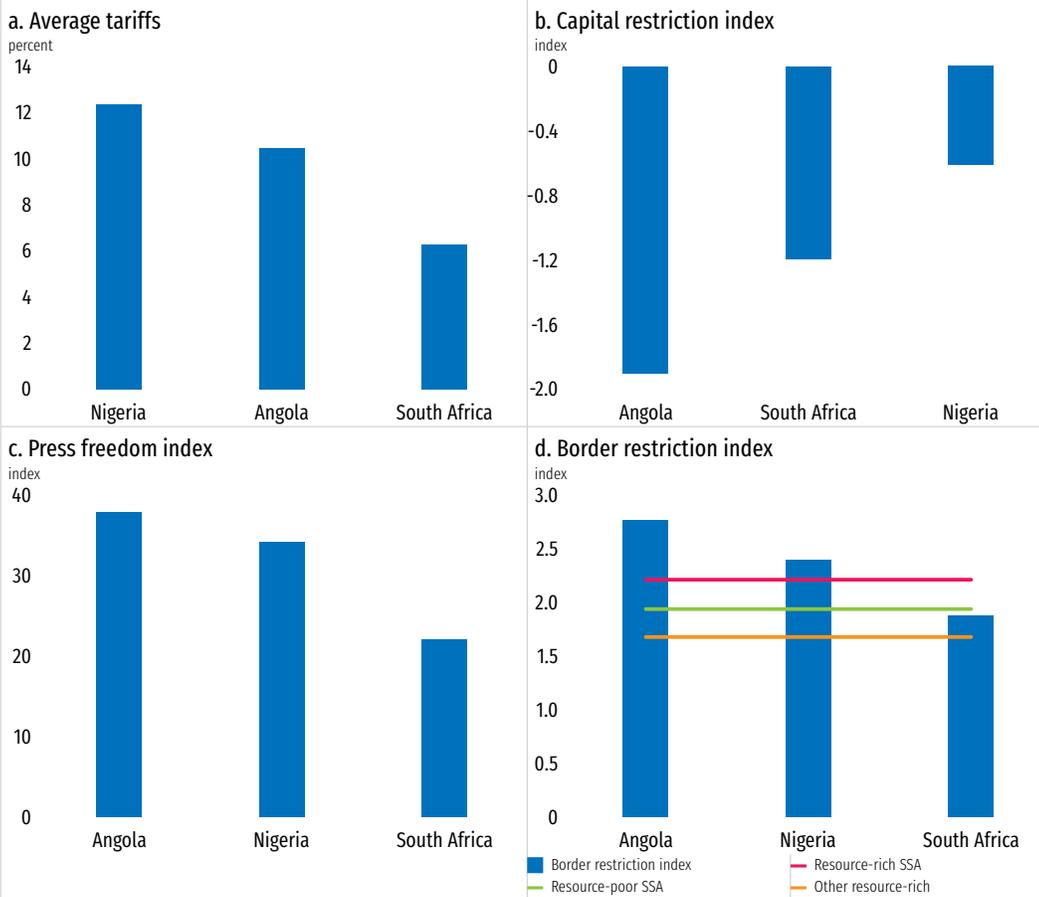
Source: Calculations based on average tariffs (WDI, World Bank), press freedom index (Reporters without borders), and capital restriction index (Chinn and Ito, 2015), and restrictions on people (percentage of countries needing a visa to enter, Neumayer 2006)
Note: As in the *World Development Report* (World Bank 2009), the border restriction index summarizes four indicators: restrictions on the flow of goods, ideas, capital, and people. The indicators were normalized and rescaled from more open to less open borders and then summed. For all indicators, smaller is better.

Figure 56. GDP per Capita and Border Restrictions, 2007–2015

a. Border restrictions, 2007

log of GDP per capita

$y = -0.86^{***}x + 10.35^{***}$
$R^2 = 0.264$

border restrictions

b. Border restrictions, 2015

log of GDP per capita

$y = -0.84^{***}x + 10.69^{***}$
$R^2 = 0.264$

border restrictions
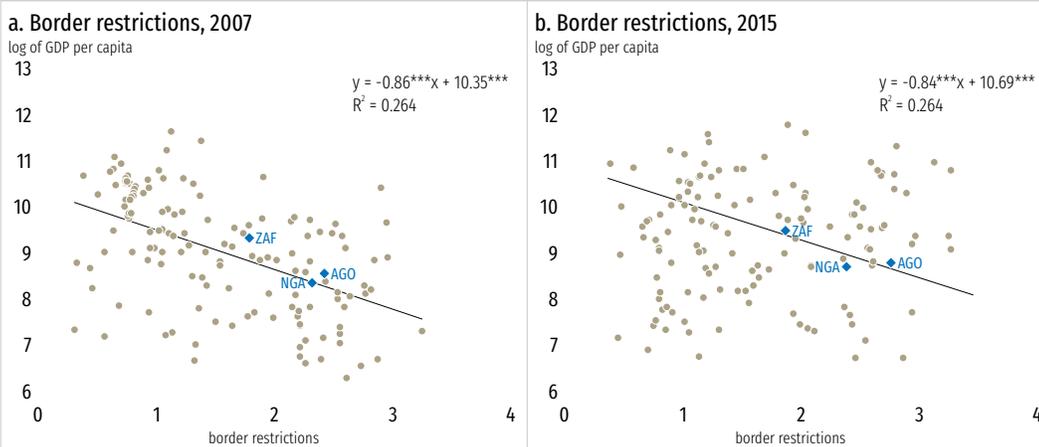
Source: Based on average tariffs (WDI Bank), press freedom index (Reporters without borders), and capital restriction index (Chinn and Ito, 2015), and restrictions on people (percentage of countries needing a visa to enter, Neumayer, 2006).
Note: On the x-axis, border restriction index: a lower value indicates more open borders. The y-axis represents the logarithm of GDP per capita, PPP in international US dollars. The coefficients and R-squared displayed in the figure are from estimations using all sample of countries. *** means significance at the 1 percent level.

Distance to Markets

Distance is an obstacle to development. International trade patterns are influenced by proximity to large markets and they in turn impact economic development. While actual distances to world markets for many African countries are not very different from those of some countries in the largest developing regions, the combination of distances to world markets and to neighbors results in high economic distances for SSA (Figure 57). Economic distances are quite similar for resource-poor and resource-rich SSA countries.

Figure 57. Economic Distances in Regions Compared, 2016
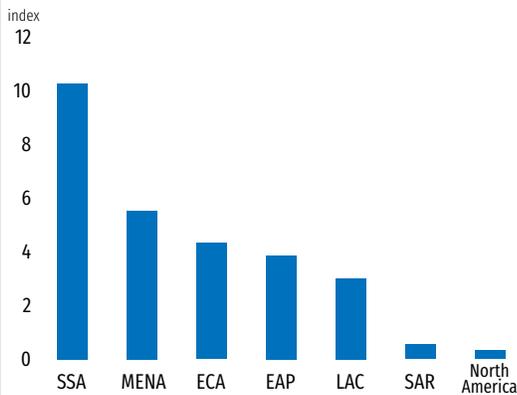
index

Note: The index of economic distance is based on Manners and Behar (2007): *Economic distance$_i$ = (Σ_j GDP$_j$ d$_{ij}$ / Σ_j GDP$_j$).* GDP in 2010 in constant US dollars in 2016. *d$_{ij}$* is distance between the most populous cities in countries *i* and *j*. Economic distance measures for regions are then aggregated using population weights: *Economic distance$_r$ = (Σ_j POP$_j$ d$_j$ / Σ_w POP$_w$). POP$_w$* is the world population.

Figure 58. Foreign Market Potential of African Countries, 2003
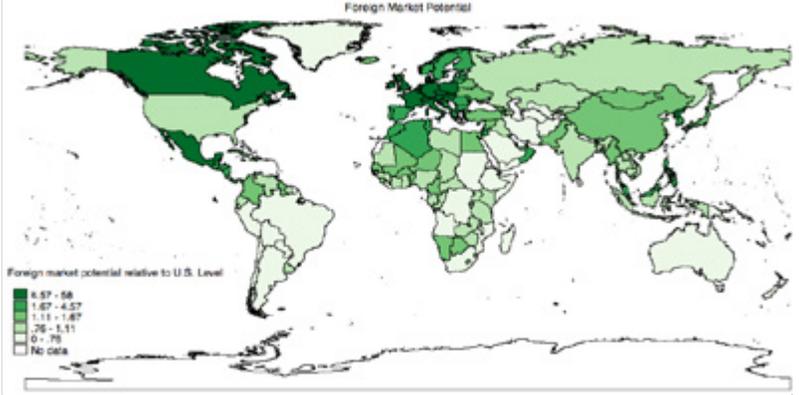
Source: Mayer 2008.
Note: Index: darker indicates higher potential of a country's foreign markets. To assess foreign market potential, each country is assigned a score for the size of international markets with which it can trade, is computed by weighting the GDP of other countries by the inverse of a measure that combines physical distance, transport costs, and barriers to trade to show how difficult it is to access these markets. The measure, which is expressed relative to the foreign market potential of the United States, essentially combines the two spatial dimensions of distance and division into a composite of potential market access that does not include the effect of the home market (density).

Thick borders exacerbate economic distances. An index that combines distance with policies to reduce divisions indicates that foreign market potential is higher in Europe, South East Asia, and North and Central America than in Sub-Saharan Africa (Figure 58); within SSA, on average foreign market potential is slightly higher in resource-poor than in resource-rich SSA. In South Africa, Angola, and Nigeria, access to foreign markets is relatively lower than in Namibia and Botswana despite their proximity. Among other factors at play are trade facilitation policies.

Figure 59. Intraregional Trade, SSA, EAP, and the EU, 2016

in percent
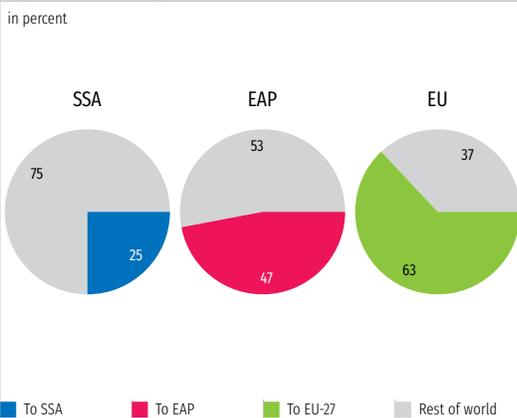
Source: UN COMTRADE, BEC classification.
Note: SSA includes only 28 countries because of data availability problems.

Intraregional Trade

Trade between countries in SSA is less than in other developing regions. Intraregional trade accounts for 25 percent of total SSA exports and even less for the resource-rich SSA, compared with 63 percent in the EU and 47 percent in EAP (Figure 59 and Appendix 2). Though SSA intraregional trade has doubled since 2000, it has not increased as much in percentage terms as in EAP and the EU. Exports to South Africa accounted for 5.7 percent of the SSA total in 2016, up from 2.5 percent in 2000 (Figure 60). Since 2000 the share of exports from the three MICs to the rest of SSA has increased by just 7 pp of total exports.

Figure 60. Trade between Angola, Nigeria and South Africa and the Rest of SSA

a. Exports from SSA by destination
in percent of total

Legend: ZAF, NGA, AGO, Other SSA

b. Exports from Angola, Nigeria and South Africa to SSA
in percent of total

Legend: AGO, NGA, ZAF

Source: IMF Direction of Trade Statistics (DOTS) database.
Note: The indicator used is exports of goods, Free on board (FOB), US Dollars.
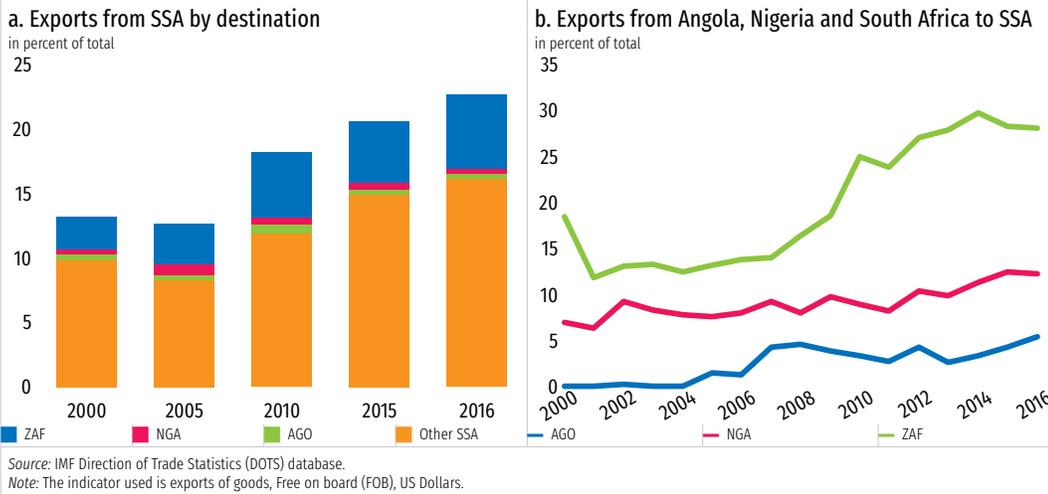
While intraregional trade is up, its volume has been constrained by the limited complementarity of SSA exports. While trade complementarity is high in Italy/France and Mexico/United States, it is much lower on average between SSA countries (Figure 61). In great part, this reflects the limited reach of regional and global value chains. With similar endowments across the resource-rich or the resource-poor universe, the engine of trade is still not operating at full capacity. Still, some resource-rich countries, such as South Africa and Angola, have relatively high complementarity in their trade with other SSA countries. And the resource-poor SSA countries trade more with the three largest resource-rich MICs than with the rest of the SSA. All in all, while natural resources account for nearly 80 percent of SSA's exports, they account for just 40 percent of intraregional exports.

Figure 61. The complementarity of exports is low in both resource-rich and resource-poor SSA

index, higher value indicates more complementarities, 2016

a. Resource-rich SSA

b. Resource-poor SSA

c. Selected countries

Source: WITS.
Note: Each SSA country is paired with other SSA countries. The trade complementarity index is measured as follows: *Trade complementarity index = 100*[1-Σ_k|m_{jk}/M_j - X_{ik}/X_j |] where x is the value of exports of product k from country I and X indicates country I's total exports; m is the value of country j's imports of product k and the total value of country j's imports is given by M. The index indicates the extent to which the export profile of the reporter country complements the import profile of the partner. The index range is from 0 (the trading partners are perfect competitors) to 100 (the countries are ideal partners).

The share of intermediate goods in the trade of resource-rich countries with the rest of the SSA rose from 30 percent in 2013 to about 35 percent by 2016. This is good progress in a few short years. To give a sense where increased regional integration is likely to take resource-rich Africa, a few comparisons are needed. For example, 79 percent of Mexico's

Figure 62. Trade in Raw Materials, Intermediate, Consumption, and Capital Goods in SSA

a. Exports to SSA
in percent of total exports

b. Imports from SSA
in percent of total imports

Legend: Intermediate goods, Raw materials, Consumption goods, Capital goods

Source: Based on UN Broad Economic Classification, UN COMTRADE.
Note: Consumption goods also include BEC REV 2 section 7: goods not elsewhere specified.
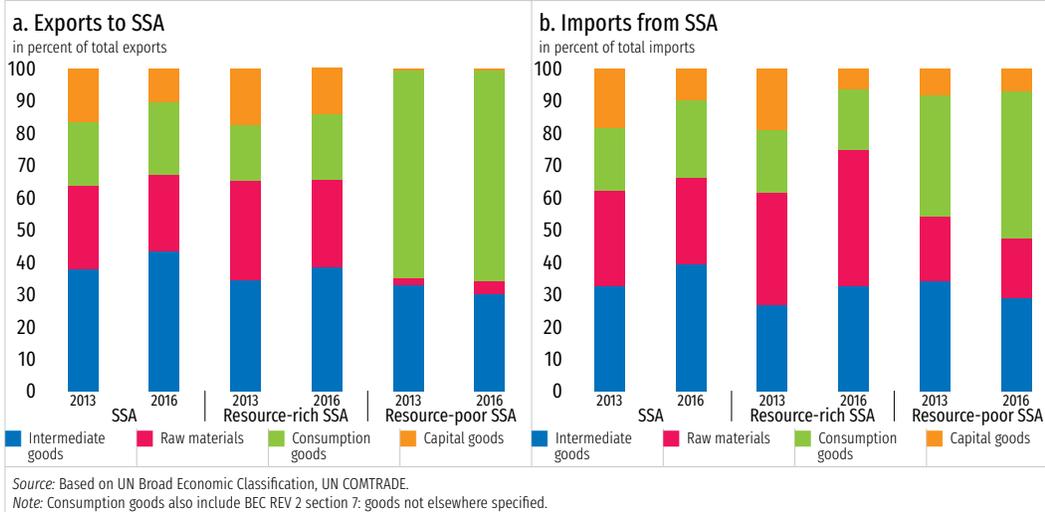
imports from the US and 41 percent of its exports to the US are intermediate goods (Figure 62)[18]. For the OECD countries on average, the share of intermediate goods in trade was 56 percent in 2010. As trade in intermediate goods is more sensitive to trade costs and distance (Redding and Venables, 2004), regions that are better integrated, especially within GVCs, tend to trade more in intermediate goods. As resource-rich Africa builds up its human capital and infrastructure and strengthens its regional integration, trade in intermediate goods will likely grow substantially.

Some studies and anecdotal evidence suggest that informal cross-border trade is substantial. The ECENE survey (Enquête sur le commerce extérieur non enregistré) suggests that informal exports from Nigeria to Benin as large as formal ones while imports are five times as large (Bensassi, Jarreau, and Mitaritonna, 2017).[19] The Central Bank of Nigeria estimates the country's informal trade, both exports and imports, amounted to as much as $6.9 billion in the twelve months ending in May 2014, or about 10 percent of formal trade.[20] Food products accounted for the bulk of goods traded informally between Nigeria and its neighbours. Another study estimates that informal trade amounted to about $17.6 billion, or about a third of total trade between the members of the South African Development Community (SADC).[21] Maize is the most informally traded goods in Southern Africa, with Mozambique, Zambia, South Africa, and Tanzania the major exporters.

Remittances and FDI

Remittances are an important channel for transmitting growth shocks. Remittances to SSA have soared in the past 10 years, reaching $38 billion in 2017, of which one-third come

---

18 https://www.ineteconomics.org/uploads/general/US-Mexico-Trade-Relationship_Kenneth-Smith-Ramos_5-30-17.pdf

19 http://www.cepii.fr/PDF_PUB/wp/2017/wp2017-21.pdf

20 https://www.cbn.gov.ng/out/2018/sd/measuring%20informal%20cross-border%20trade%20in%20nigeria.pdf

21 tps://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Economic%20Brief%20-%20Informal%20Cross%20Border%20Trade%20in%20Africa%20Implications%20and%20Policy%20Recommendations%20-%20Volume%203.pdf

Figure 63. Remittance Inflows in SSA, SAR, and EAP

a. Remittances inflows, by region
in hundred millions of US dollars

b. Resource-rich versus resource-poor SSA
in percent of GDP

Source: Based on Global Knowledge Partnership on Migration and Development (KNOMAD) database and WDI.
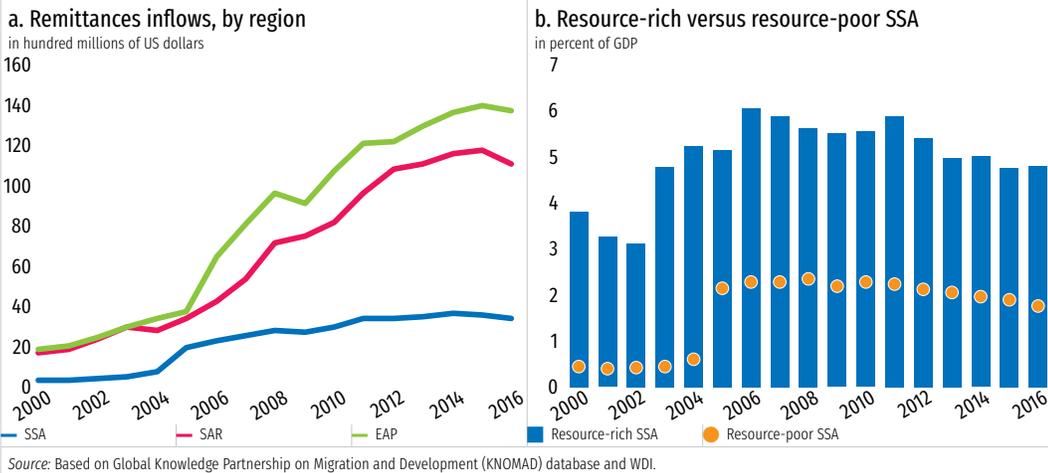
Figure 64. Destinations of Remittances Earned in SSA Countries, 2016

a. Remittances, outflows
in percent

b. Remittances, inflows
in percent

Source: Based on Global Knowledge Partnership on Migration and Development (KNOMAD) database.
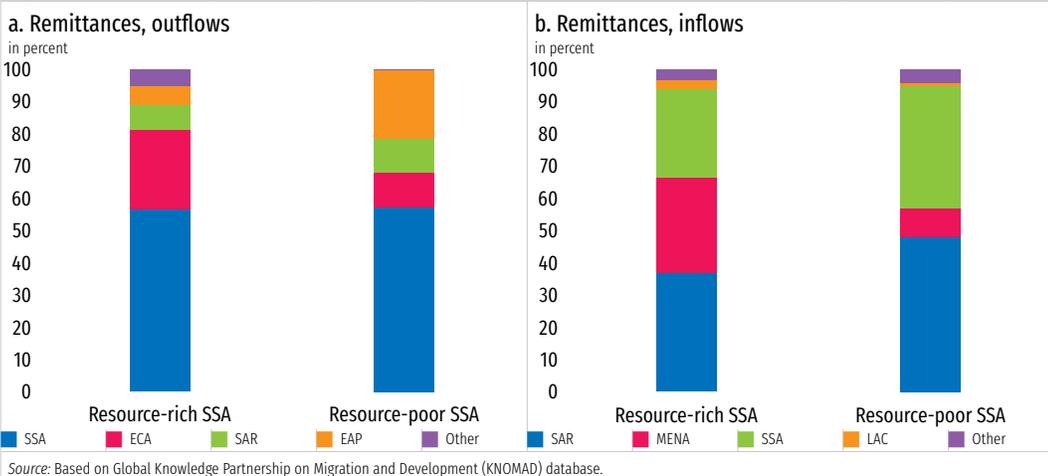
Figure 65. Destination of Remittances from Nigeria, 2016
in percent

Source: Global Knowledge Partnership on Migration and Development (KNOMAD) database.
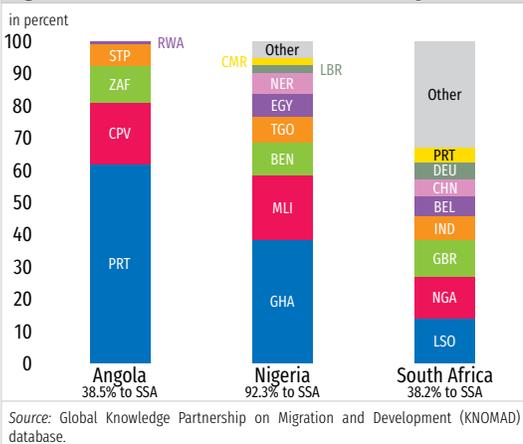
from within the region. However, remittances to SSA are three to four times lower than remittances to South Asia and EAP, which signals considerably smaller per capita transfers from outside the region (Figure 63). In turn, as a share of GDP, remittances to resource-rich SSA are just one-third those to resource-poor SSA countries, although resource-rich Nigeria receives two-thirds of all remittances to SSA. South Asia is the top sending region for both resource-rich and resource-poor countries (Figure 64).

Almost one-third of remittances originating in SSA go to other SSA countries. This share is near the median among shares of the world's developing regions: intraregional remittances in South Asia and LAC are only about 10 percent of the total while in ECA they are 75 percent. Within SSA, almost all remittances from Nigeria go exclusively to the rest of SSA—those to Ghana alone account for more than 38 percent (Figure 65). In contrast, more than half of the remittances from South Africa and Angola go to countries outside SSA, including the EU.

Figure 66. Inflows of FDI into SSA

Source: WDI.
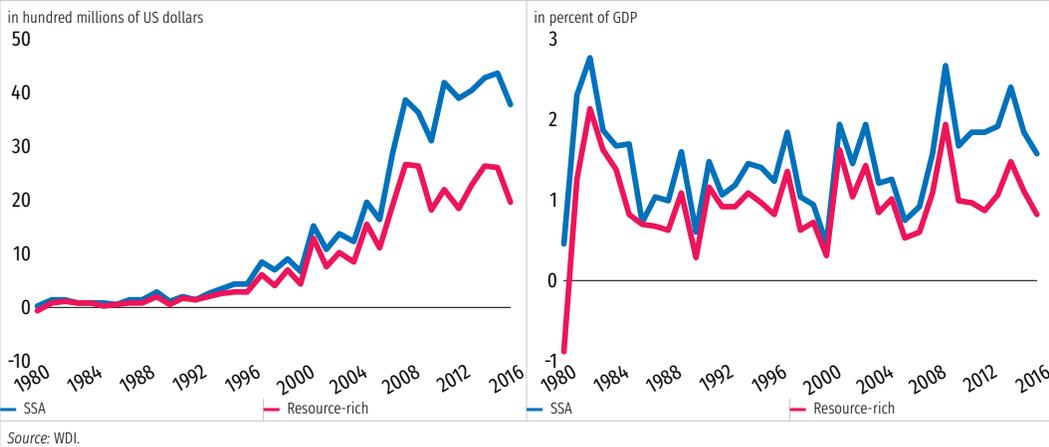
More than two-third of migrants residing in SSA are from the region. Among the top 10 host countries for citizens of SSA, seven are SSA countries: South Africa, Côte d'Ivoire, Uganda, Nigeria, Ethiopia, Kenya and the Republic Democratic of Congo. In 2017, the bulk of the migrants residing in Angola (70 percent), Nigeria (80 percent) and South Africa (54 percent) were from other SSA countries.

Since 2014, inflows of FDI to resource-rich SSA have slowed as interest in natural resource extraction waned following the boom earlier in the decade. Now, with a pickup in oil prices, investment is likely to strengthen again. Measures to improve the frameworks that regulate exploration, development and extraction will serve the resource-rich countries well. In contrast to resource-rich SSA, flows to the rest of the subcontinent have been more buoyant since the global recession, although they were recently flat relative to GDP (Figure 66).

Intraregional flows of FDI are modest and concentrated in South Africa. In 2016, the last year for which disaggregated data are available, intraregional flows of FDI, measured by project commitments rather than balance of payments data, accounted for 2.1 percent of total inflows to the region. Of those, 80 percent were from South Africa, with the rest mainly split between Nigeria and Kenya. Globally, outflows of FDI are positively correlated with GDP per capita, adjusting for the size of the economy. In that sense, the low intraregional FDI inflows are not a surprise. What is a surprise, however, is that even countries with substantial foreign exchange reserves, notably the resource-rich economies, have been reluctant to invest outside their borders. De-risking SSA would do much to bolster intraregional investment.

Growth Spillovers

The growth patterns of SSA economies are not well synchronized, reflecting the forces of distance and division. Modest intraregional trade and remittance flows, negligible intraregional capital flows other than from South Africa, and limited complementarity of production and exports are the proximate causes. Resource-rich countries are subject to common external shocks, notably movements in commodity prices, shifting patterns of global commodity demand, and recently foreign investment in new extraction and development.

Bilateral regressions of growth in each of the three MICs and neighbors sharing a common border suggest some significant correlations. These results must be interpreted with caution, however, as they could be due to common shocks, such as the global recession and the subsequent slowdown of global growth. The results are, nonetheless, not surprising:

- South Africa's GDP is significantly correlated at 0.5 with those of Botswana, Namibia, and Swaziland. The last two countries send more than 20 percent of their exports to South Africa and Botswana sends about 10 percent, so this result is not surprising. South Africa's links with the other members of the Southern Africa Development Community (SADC) are getting stronger. SSA receives 27 percent of South Africa's total exports compared with the 25 percent share of SSA's intraregional exports and much larger shares for countries as diverse as Senegal, Uganda, and Togo.

Figure 67. Bilateral Correlations of Growth Rates in SSA

Source: WDI, World Bank.
Note: The dot, square, and diamond indicate significance level at 10 percent, 5 percent, and 1 percent, respectively.

Figure 68. Per Capita GDP Growth Rates, Large SSA MICs and Their Neighbours, 2000–16

Source: WDI, World Bank.
Note: Neighbors of Angola are D.R. Congo, Congo, Rep., Zambia, and Equatorial Guinea. Neighbors of Nigeria are Benin, Cameroon, Chad, Niger, Ghana and Togo. Neighbors of South Africa are Zimbabwe, Botswana, Namibia, Mozambique, Swaziland and Lesotho.

- Nigeria's growth appears to be significantly correlated only with that of Chad, reflecting the strong dependence of the growth of these two economies on oil rather than trade between the two. Intensive informal regional trade with Benin and Cameroon, however, suggests that the lack of correlation might be due to measurement. As financial links tighten and Nigerian banks become more active in the region, formal trade might also increase.

- Angola's growth has no correlation with that of its neighbors (Figures 67 and 68).
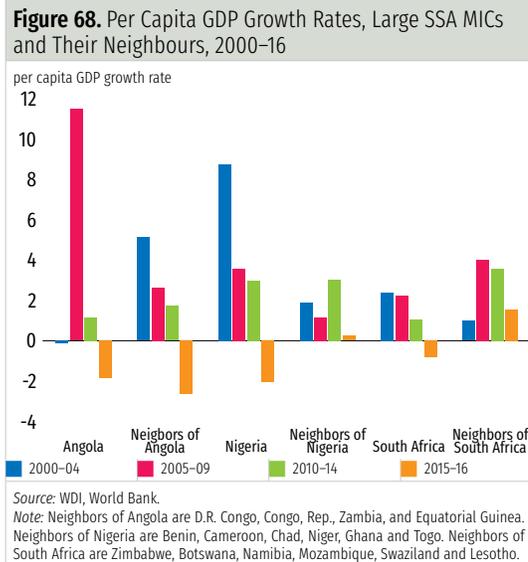
A statistic that captures the correlation between all countries in a neighborhood is likely to be more powerful in indicating whether growth rates tend to cluster. Spatial autocorrelation analysis suggests there is little evidence of statistically significant links between growth rates in SSA as a whole. This analysis uses four measures of a neighborhood: a common border between countries; distance; geographical region; and membership in a formal regional economic community (Appendix 3).[22] The Moran I statistic is used to examine spatial autocorrelation.[23]

For SSA as a whole, there is no evidence of significant spatial correlations except for two subperiods based on different specifications of what constitutes a neighborhood. For 2000–14, using a common border to define a neighborhood results in significantly dissimilar growth rates for the whole subcontinent (Appendix 4 and 5). Similarly, using distance to define a neighborhood results in significantly dissimilar growth rates for 2005–09. In

---

22   For example, see Ades and Chua (1997), Weinhold (2002) and Roberts and Deichmann (2009).

23   Moran's I measures the spatial autocorrelation of variables. "Spatial autocorrelation is more complex than one-dimensional autocorrelation because spatial correlation is multi-dimensional and multi-directional," according to Wikipedia's description. The statistic is used to measure how real GDP growth rates correlate within neighborhoods (see Box 1). This statistic indicates whether there is evidence of statistically significant clustering of growth rates for each five-year period (2000–04, 2005–09, and 2010–14). Moran's I statistic is defined as follows: $I = ((\sum_i \sum_j w_{ij} (g_i - M)(g_j - M)) / \sum_i (g_i - M)^2)$, where g_i is the growth rate of country i, w_{ij} is the corresponding weight in the neighborhood weights matrix, and M the mean rate of growth in the sample.

Figure 69. Spatial Correlations for Neighborhoods, 2000–14
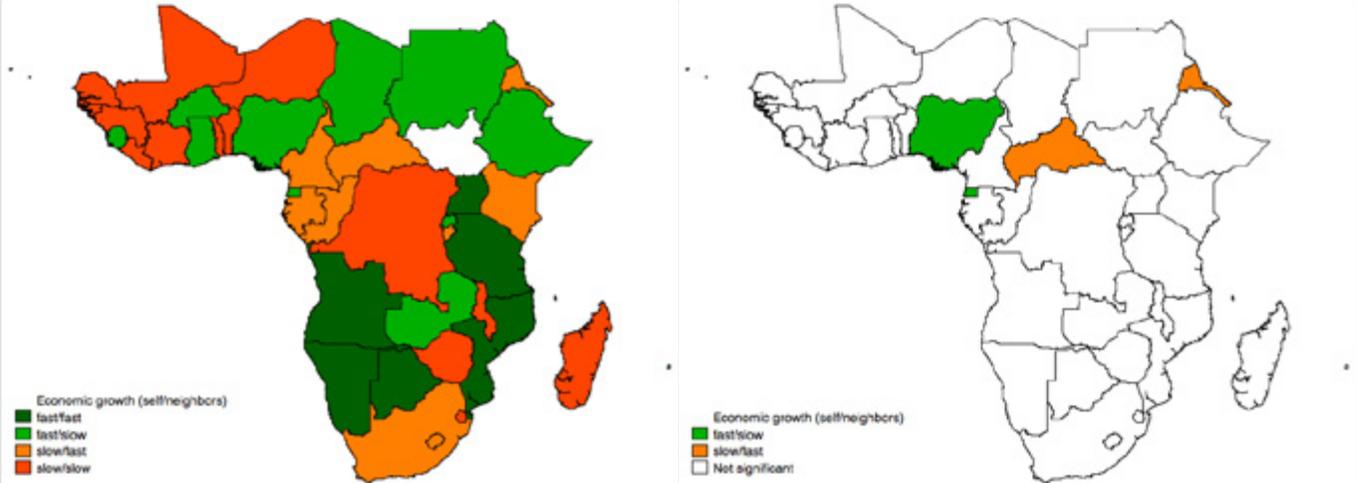
Source: Own calculations using WDI data.
Note: White color = no data. This map provides no indication of the statistical significance of the various clusters.

general, the results suggest that there are no significant relationships between growth rates over space and time. By contrast, spatial autocorrelation of growth rates in EAP is significantly positive for all four specifications.

More generally, there is no evidence of growth spillovers from the larger economies to their neighbors. To examine whether there are geographically defined subgroups, we constructed a scatterplot of growth rates against the weighted growth rates (Figure 69), with weights defined by the matrix using the formal regional economic community definition of a neighborhood (Anselin 1995). The four quadrants of the scatterplot define four types of countries. The upper left and lower right quadrants indicate spatial association of dissimilar values: slow-growing countries with fast-growing neighbors (LH) and fast-growing countries with slow-growing neighbors (HL). The upper right and lower left quadrants indicate spatial association of similar values: fast-growing countries with fast-growing neighbors (HH) and slow-growing countries with slow-growing neighbors. Figure 69 summarizes the results using average growth rates for 2000–14. On the left panel, there are six countries that grow fast and have fast-growing neighbors and 13 countries that grow slowly and have slow-growing neighbors. That is, about half the countries in Africa are in neighborhoods where countries appear to be growing in sync. Unfortunately, there are only four cases where the spatial correlations are significant, and they are for dissimilar rather than similar growth rates. Nigeria, for example, is a country with a high average growth rate in a neighborhood of countries that are growing slowly.

Our analysis suggests there are no growth spillovers from Angola, Nigeria and South Africa on the other countries in SSA. First, we run a fixed effects spatial panel regression (Appendix 6). The results show no evidence of statistically significant growth spillovers in Sub-Saharan Africa. This finding is similar to that in Roberts and Deichmann (2009). Their results show that growth spillovers have been absent in Sub-Saharan Africa over the period 1970–2000 while there were strong spillovers between OECD countries. Second, we run pooled regressions with fixed effects for each of the three largest middle-income countries in Africa (Appendix 7). For each regression, the dependent variables include factors helping explain growth in one of the MICs, global variables, and regional variables. We use two periods for the regressions:

1960-2016 and 2000-2014. The results are largely universal: there are no growth spillovers from the three large middle-income countries to the rest of the subcontinent.

Previous studies arrive at similar results of no significant spillovers from Angola, Nigeria, and South Africa to the rest of the region. The World Bank's Global Economic Prospects 2016 reviews several of these studies.[24] Using a global vector autoregression (GVAR) Gurara and Ncube (2013) found no spillovers from Nigeria and South Africa but significant growth spillover effects from both the Eurozone economies and the BRICS. Using a similar model, Kinfack and Bonga-Bonga (2015) showed that SSA's real GDP reacts positively to GDP increases in the Eurozone and China. Using a pooled regression without fixed effects, the IMF's 2012 Regional Economic Outlook for Africa also concluded that spillovers from Nigeria and South Africa are very modest for their immediate neighbors and insignificant for SSA as a whole. Our results confirm the findings of the earlier studies by using a more robust pooled regression with fixed effects.

The Path Forward

To succeed, developing countries need to be integrated into world markets. Despite some progress in recent years, the resource-rich African countries still have heavy barriers around their borders, which exacerbates the fragmentation inherited from colonization and makes Africa the continent most prone to ethnic-based conflicts. SSA countries also have some of the smallest domestic markets in the world, except for the three resource-rich MICs, Angola, Nigeria, and South Africa, and a few less resource-endowed countries.

What policies can help overcome the triple disadvantage of low economic density, long distance to world and regional markets, and thick borders? The development experience of EAP and recently of South Asia makes the answer clear: use the advantage of low labour costs and a large domestic labour force, perhaps just moving out of agriculture in search of employment; provide political and macroeconomic stability; and work closely with foreign investors to arrange for better local infrastructure and access to export routes. These policy lessons are actionable recommendations for national governments in many areas, such as the emphasis on bolstering investment in infrastructure and human capital and improving market and government institutions. In other words, strengthen institutions and policies to generate more robust growth spillovers in the neighborhoods of the resource-rich economies.

But different circumstances make it difficult for the resource-rich SSA countries to replicate East Asia's success by integrating globally. First, most African countries are smaller than those of East Asia in terms of population, size of the domestic consumer market, percentage of the labour force with a minimum primary education, and economic proximity to global markets or to neighbours. For example, the median population of the SSA countries is about 12 million, compared with 50 million in emerging Asia (excluding China and India). Moreover, global trade integration has advanced considerably since the 1960s, when the East

---

24   World Bank. 2016. Global Economic Prospects. http://pubdocs.worldbank.org/en/697191452035053704/Global-Economic-Prospects-January-2016-Spillovers-amid-weak-growth.pdf

Asian tigers began their dramatic rise. And global markets have become considerably more contested and production much more segregated into tasks that require substantial economies of scale and excellent connectivity with trading partners. Finally, the relentless march of technology has reduced manufacturing employment and dampened the advantage of low-cost labour relative to capital. Policies to improve the endowment of capital thus need to be supplemented by regional efforts to create larger markets that cross borders and make SSA countries more attractive to both foreign and domestic investors.

One initiative that can speed integration of the countries in SSA is the Framework Agreement establishing the African Continental Free Trade Area (CFTA) signed by 44 countries in Rwanda on March 21, 2018. Four of SSA's resource-rich countries did not sign the agreement (Nigeria, South Africa, Botswana and Zambia), although South Africa recently agreed to sign and Nigeria's government has also indicated it intends to sign soon. Without these four resource-rich countries, less than 5 percent of the trade of signatories is intraregional, compared with 25 percent for the whole subcontinent. The Agreement will help boost intraregional trade, strengthen the complementarities of production and exports, create employment, and limit the impact of commodity price volatility on the participants. Further negotiations are planned for later this year to cover investment, competition, and intellectual property rights. Deepening the CFTA will be important. It will also be important for the countries that have stayed out thus far to join. A caveat is in order, however. Member countries must avoid creating a trade area that provides a larger captive market without making the companies of the member countries more competitive and ready to take on global markets.

Another way to help rekindle growth is to make the neighborhoods of the resource-rich African countries more vibrant, especially those that include the three largest resource-rich countries and perhaps other large MICs. This could be done by granting all the countries in regional groupings, such as ECOWAS, SADC, ECCAS, and EAC, preferential access to leading world markets with attractive rules of origin, conditional on their taking the lead in promoting regional integration in West, Southern, Central, and East Africa. This might require revisiting the U.S. African Growth Opportunity Act and the EU Everything but Arms program, two preferential agreements that have been available to some developing countries since 2001. In the spirit of the G20 Compact with Africa (CWA), a complementary Aid-for-Trade initiative could help bolster investment in sectors other than natural resources, helping build up non-resource exports from countries in their neighbourhoods.

The proposed approach would trigger at least three channels of regional spillovers:

- A **distribution effect** from the three resource-rich MICs to their regional economic partners through trade in goods and services and cross-border movement of labour and capital searching for better opportunities (Coulibaly, 2017)[25].
- A **domino effect** helping countries close to the neighbourhoods of these three MICs to join the integration process so they can take full advantage of the new economic opportunities generated by coordination of foreign aid.

---

25   Coulibaly, S. 2017. "Differentiated Impact of AGOA and EBA on West African Countries." Manuscript. Africa Chief Economist Office. The World Bank.

- A **demonstration effect** encouraging other subgroups of countries to deepen their regional integration to take advantage of the coordinated CWA and Aid-for-Trade initiatives.

The international community could also shift to a Contract with resource-rich African Neighbourhoods that specifically involves countries by neighbourhood and development partners as incentives for closer regional cooperation. For instance, the governments of the East, Central, South, and West African neighbourhoods could commit to:

- Establishing African Economic Areas that would tie together the economic interests of leading and lagging countries in each regional neighbourhood
- Encouraging the free movement of labour, capital, goods, and services within these areas
- Maintaining and protecting access routes between land-locked countries and outlets for trade, as well as providing the political space to support investment in regional infrastructure essential for the neighbourhood.

In exchange for these cross-country actions, bilateral and multilateral development partners could commit to:

- A large increase in international financial assistance for improved social services and other life-sustaining infrastructure designed to raise living standards and create portable human capital in lagging countries
- Increased financial support for growth-sustaining infrastructure—ports, transport links, information and communication technology—in countries where economic take-off is most likely, as well as infrastructure to link the markets of leading countries with labour, capital, goods, and ideas from their lagging neighbours; and
- Preferential access for SSA exports to the markets of high-income countries, without strict rules of origin or eligibility criteria that impede rapid growth of trade in intermediate inputs with other developing countries.

References

Ades, A., and H. B. Chua. 1997. "Thy Neighbor's Curse: Regional Instability and Economic Growth". *Journal of Economic Growth*, 2(3): 279–304.

Alesina, A., F. R. Campante, and G. Tabellini. 2008. "Why is Fiscal Policy Often Procyclical?". *Journal of the European Economic Association*, 6(5): 1006-1036.

Anselin, L. 1995. "Local Indicators of Spatial Association — LISA". *Geographical Analysis*, 27(2): 93–115.

Arezki, R, F. van der Ploeg, and F. Toscani. 2016."The Shifting Natural Wealth of Nations". https://voxeu.org/article/shifting-natural-wealth-nations.

Barro, R. 1991. "Economic Growth in a Cross Section of Countries". *Quarterly Journal of Economics*, 106(2): 407-433.

Chinn, M. D., and H. Ito. 2008. "A New Measure of Financial Openness". *Comparative Policy Analysis*, 10(3): 309–322. Database updated to 2015. http://web.pdx.edu/~ito/Chinn-Ito_website.htm.

Collier, P. 2011. "The Plundered Planet: Why we Must — and How we Can — Manage Nature for Global Prosperity". *Oxford University Press*.

Commission on Growth and Development. 2008. "The Growth Report : Strategies for Sustained Growth and Inclusive Development". Washington, DC : World Bank. https://openknowledge.worldbank.org/bitstream/handle/10986/6507/449860PUB0Box3101OFFICIAL0USE0ONLY1.pdf?sequence

Corrigan, C. C. 2014. "Breaking the resource curse: Transparency in the natural resource sector and the extractive industries transparency initiative". *Resources Policy*, 40(C): 17-30.

Coulibaly, S. 2017. "Differentiated Impact of AGOA and EBA on West African Countries." Manuscript. Africa Chief Economist Office, The World Bank.

Dabán, T. 2011. "Strengthening Chile's Rule-Based Fiscal Framework." IMF Working Paper WP 11/17.

Danforth, J., P. A. Medas, and V. Salins. 2016. "How to Adjust to a Large Fall in Commodity Prices". Fiscal Affairs Department, International Monetary Fund, Washington, DC.

Diop, M. 2016. "Africa in Focus: Foresight Africa 2016: Banking on agriculture for Africa's future". *Africa in Focus*, The Brookings Institution, Washington DC.

Durlauf, S., P. Johnson, and J. Temple. 2005. "Growth Econometrics" Chapter 08 in Handbook of Economic Growth, volume 1, part A, pages 555-677, Elsevier.

Edwards, S. 2012. "Is Tanzania a Success Story? A Long Terms Analysis". NBER Working Paper No. 17764. http://www.anderson.ucla.edu/faculty/sebastian.edwards/Papers%20Files/Is%20Tanzania%20a%20Success%20Story.pdf

Fall, M. (Editor), S. Coulibaly (Editor). 2016. "Diversified urbanization : the case of Côte d'Ivoire". Washington, D.C. : World Bank Group. http://documents.worldbank.org/curated/en/519221472632647499/Diversified-urbanization-the-case-of-Côte-d-Ivoire

Frankel, J. A., and D. Romer. 1999. "Does Trade Cause Growth?" *American Economic Review*, 89(3): 379-399.

Gelb, A. 2000. "Can Africa Claim the 21st Century?" World Bank, Washington, DC. http://siteresources.worldbank.org/INTAFRICA/Resources/complete.pdf.

Gill, I. S., I. Izvorski, W. van Eeghen, and D. De Rosa. 2014. "Diversified Development : Making the Most of Natural Resources in Eurasia." Europe and Central Asia Studies. Washington, DC: World Bank.

Gill, I. S., A. L. Revenga, and C. Zeballos. 2016. "Grow, invest, insure : a game plan to end extreme poverty by 2030". Policy Research working paper; No. WPS 7892. Washington, D.C. : World Bank Group.

Gurara, D. Z., and M. Ncube. 2013. "Global Economic Spillovers to Africa: A GVAR Approach". African Development Bank.

Hausmann, R., J. Hwang, and D. Rodrik. 2007. "What You Export Matters". *Journal of Economic Growth*, 12(1): 1–25.

International Monetary Fund, 2012b. "Regional Economic Outlook: Sub-Saharan Africa". Washington, DC (October).

International Monetary Fund, 2015. "Angola Selected Issues". IMF Country Report No. 15/302. Washington, DC. https://www.imf.org/external/pubs/ft/scr/2015/cr15302.pdf.

Jarreau, J., and S. Poncet. 2012. "Export sophistication and economic growth: Evidence from China". *Journal of Development Economics*, 97(2): 281–292.

Khan, T., T. Nguyen, F. Ohnsorge, and R. Schodde. 2016. "From Commodity Discovery to Production". Policy Research Working Paper No. 7823. World Bank, Washington, DC.

Kinfack, C. E., and L. Bonga-Bonga,.2015. "Trade Linkages and Business Cycle Comovement: An Empirical Analysis of Africa and its Main Trading Partners using Global VAR." Working Paper 512, Economic Research Southern Africa (ESRA).

Kose, A., S. A. Kurlat, F. L. Ohnsorge, and N. Sugawara. 2017. "A cross-country database of fiscal space". Policy Research working paper; no. WPS 8157. Washington, D.C. : World Bank Group.

Krause, L. B. 1987. "The Structure of Trade in Manufactured Goods in the East and Southeast Asian Region". In *Trade and Structural Change in Pacific Asia*, Colin I. Bradford, Jr. and William H. Branson, editors, University of Chicago Press.

Lange, G-M.;, Q. Wodon, and K. Carey. 2018. "The Changing Wealth of Nations 2018 : Building a Sustainable Future". World Bank, Washington, DC.

Lledo, V., S. Yoon, X. Fang, S. Mbaye, and Y. Kim. 2017. "Fiscal Rules at a Glance." Background note for the publication of the IMF Fiscal Rules Database. http:// www .imf .org/ external/ datamapper/ FiscalRules/ map/ map .htm

Manners, P. and A. Behar. 2007. "Trade in Sub-Saharan Africa and Opportunities for Low Income Countries". Background Paper for World Development report 2009. World Bank, Washington, DC.

Mayer, T. 2008. "Market Potential and Development". Discussion Paper No. 6798. Centre for Economic Policy Research.

McKinsey Global Institute, 2013. "Reverse the Curse: Maximizing the Potential of Resource-Driven Economies".

Mitaritonna, C., S. Bensassi, and J. Jarreau. 2017. "Regional Integration and Informal Trade in Africa: Evidence from Benin's Borders ". CEPII Working Paper.

Neumayer, E., 2006. "Unequal Access to Foreign Spaces: How States Use Visa Restrictions to Regulate Mobility in a Globalised World." *Transactions of The Institute of British Geographers*, 31(1): 72–84

Redding, S. J., and Venables, A. J. 2004. "Economic geography and international inequality". *Journal of International Economics*, 62(1): 53-82.

Roberts, M., and Deichmann, U. 2009. "International growth spillovers, geography and infrastructure". Policy Research working paper ; no. WPS 5153. World Bank, Washington, DC.

Schaechter, A., T. Kinda, N. Budina, and A. Weber. 2012. "Fiscal Rules in Response to the Crisis—Toward the 'Next-Generation' Rules: A New Dataset". IMF Working Paper 12/187. International Monetary Fund, Washington, DC.

Vegh, C., and G. Vuletin. 2016. "To be countercyclical or not? That is the question for Latin America". https://voxeu.org/article/be-countercyclical-or-not-question-latin-america

Weinhold, D. 2002. "The Importance of Trade and Geography in the Pattern of Spatial Dependence of Growth Rates". *Review of Development Economics*, 6(3): 369-82.

World Bank,.2009. " World Development Report 2009: Reshaping Economic Geography". World Bank, Washington, DC.

World Bank. 2013. "Unlocking Africa's Agricultural Potential". Sustainable Development Series. World Bank, Washington, DC. https://openknowledge.worldbank.org/bitstream/handle/10986/16624/769900WP0SDS0A00Box374393B00PUBLIC0.pdf?sequence=1&isAllowed=y.

World Bank. 2015. "Global Economic Prospects, Special Feature 2, June 2015: After the Commodities Boom – What Next For Low-Income Countries?". World Bank, Washington, DC. https://elibrary.worldbank.org/doi/pdf/10.1596/978-1-4648-0483-0_SF2

World Bank. 2016. "Global Economic Prospects, January 2016: Spillovers Amid Weak Growth". World Bank, Washington, DC.

World Bank. 2016. Global Economic Prospects, January 2016 : Spillovers Amid Weak Growth. Washington, DC: World Bank. http://pubdocs.worldbank.org/en/697191452035053704/Global-Economic-Prospects-January-2016-Spillovers-amid-weak-growth.pdf.

World Bank. 2017. "Systematic Country Diagnostic for Tanzania". World Bank, Washington DC.

World Bank. 2018. "Africa's Pulse, No. 17, April 2018". World Bank, Washington, DC.

World Bank. 2018. "World Development Report 2018: Learning to Realize Education's Promise" World Bank, Washington, DC.

World Economic Forum. 2014. " The Global Competitiveness Report, 2014-2015".

Appendix

Appendix 1. Basic GDP and Wealth Statistics

| | GDP | Wealth[1] | | Natural Wealth | | | | |
		Total	Per capita[2] (in US dollars)	Total	Per capita[2] (in US dollars)	Fossil energy	Metals and minerals	Land
East Asia and Pacific	30,900	302,000	140,465	31,600	14,698	5,800	4,640	16,400
MENA	4,950	42,200	161,069	18,700	71,374	17,000	138	1,230
LAC	8,280	82,700	143,080	14,200	24,567	1,780	2,620	4,900
GCC	2,890	31,800	617,476	14,200	275,728	14,100	8.01	117
Resource-rich Eurasia	4,630	34,400	155,656	9,260	41,900	6,390	813	1,220
SSA	3,120	23,100	25,469	8,370	9,228	2,010	589	4,140
Resource-rich	2,110	14,200	40,922	4,460	12,853	1,890	309	1,680
Resource-poor	46.1	293	18,086	47.9	2,957	0.48	0.16	43.10
Non-resource rich	1,010	8,940	15,964	3,920	7,000	122	280	2,460
South Asia	8,590	31,100	18,402	7,820	4,627	1,030	466	5,980

Source: Wealth of Nations, World Bank, 2018.
Notes: 1/ Total wealth equals the sum of produced capital, natural capital, human capital and net foreign assets. The table excludes net foreign assets.
2/ GDP, wealth and natural wealth are in billions of dollars. The per capita figures are in dollars.

Appendix 2. Exports in SSA, 2016

	Exports		Share (%)			
	In million of US dollars	In percent of GDP	To the 3 MICs	To the rest of SSA	To the world, excl. SSA	To SSA coastal countries
SSA countries	154,915.82	14.32	6.09	18.80	75.10	16.55
Selected Resource-rich SSA	115,552.18	15.14	3.81	19.76	76.43	14.90
Botswana	7,302.57	46.87	13.53	12.82	73.65	25.26
Nigeria	32,760.68	8.10	5.49	8.29	86.22	13.54
South Africa	71,140.27	24.08	1.37	25.60	73.03	13.36
Tanzania	4,348.66	9.19	14.82	22.23	62.95	32.83
Selected Resource-poor SSA	2,168.91	11.11	6.94	11.74	81.32	17.80
Burundi	116.69	3.88	0.51	44.21	55.28	35.54
Cape Verde	60.36	3.73	-	0.28	99.72	0.28
Gambia, The	93.67	9.71	0.04	81.54	18.42	75.63
Mauritius	1,551.89	12.75	9.07	7.43	83.51	16.31
Sao Tome and Principe	10.45	3.05	1.11	0.16	98.73	1.27
Seychelles	335.85	23.53	2.72	3.35	93.93	6.06
Other SSA countries	37,194.73	12.42	13.14	16.24	70.62	21.62
Benin	328.45	3.83	8.30	15.32	76.38	16.44
Burkina Faso	2,508.96	21.46	3.63	9.55	86.82	11.88
Cameroon	2,005.70	6.23	1.15	10.66	88.20	7.10
Central African Republic	88.41	5.03	0.00	24.55	75.45	9.42
Ethiopia	1,488.98	2.06	0.95	5.46	93.60	2.93
Ghana	10,361.33	24.27	3.87	9.92	86.21	8.40
Madagascar	2,029.55	20.29	3.30	3.55	93.15	6.75
Mali	2,750.29	19.60	48.64	14.10	37.26	58.71
Mauritania	1,547.21	32.65	4.56	5.67	89.77	9.64
Mozambique	2,847.95	25.86	23.98	5.88	70.14	24.96
Namibia	2,948.32	26.93	23.51	28.43	48.06	27.13
Niger	775.24	10.30	1.81	2.56	95.64	3.15
Rwanda	405.57	4.84	0.23	39.63	60.14	33.77
Senegal	2,252.17	15.34	0.72	43.67	55.61	25.03
Sierra Leone	451.13	12.07	0.03	35.53	64.44	35.57
Togo	569.24	12.94	5.33	64.90	29.77	38.58
Uganda	1,888.07	7.84	0.28	42.91	56.81	23.76
Zimbabwe	1,948.16	11.72	72.44	17.97	9.58	85.09

Source: UNCOMTRADE, classification BEC

Appendix 3. Defining Neighborhoods through Contiguity Matrices

We use four neighborhood (**W**) weights matrices[a]:

1. **W_1 : Contiguity definition.** For $\forall\ w_{ij} \neq w_{ii}$, $w_{ij} = 1$ if countries i and j are contiguous; otherwise $w_{ij} = 0$. Only countries that share a common border are considered neighbors.

   Using a common sample of 46 SSA countries, W_1 shows that on average each country has over 3 neighbors. In addition, 6 countries are islands[b] and don't share a contiguity relationship with another country. The three resource-rich SSA countries have the following neighbors: Nigeria (Benin, Cameroon, Chad and Niger); Angola (Democratic Republic of Congo, Republic of Congo, Namibia and Zambia); and South Africa (Botswana, Lesotho, Mozambique, Namibia, Swaziland, and Zimbabwe).

2. **W_2 : Distance definition.** We create a 5 nearest-neighbors inverse-distance spatial weighting matrix. The matrix is computed using the coordinates from the capitals of Sub-Saharan African countries. These data are from Natural Earth.[c] With matrix W_2, the neighboring countries of Nigeria are Benin, Cameroon, Equatorial Guinea, Niger and Togo. Angola has the following neighbors: Democratic Republic of Congo, Republic of Congo, Equatorial Guinea, Gabon and Sao Tome and Principe. Finally, Botswana, Lesotho, Mozambique, Swaziland and Zimbabwe are the neighbors of South Africa.

3. **W_3 : Geographical regions definition.** Relying on the geographical regions of the United Nations Statistics Division, we specify the different regions of Sub-Saharan Africa (Western, Eastern, Central and Southern regions).[d] For $\forall w_{ij} \neq w_{ii}$, $w_{ij} = 1$ if countries i and j belong to the same region; otherwise $w_{ij} = 0$. Our social network spatial matrix W_3 shows that on average, each country has 12 neighboring countries.

4. **W_4 : Formal Regional Economic Communities definition.**[e] For $\forall\ w_{ij} \neq w_{ii}$, $w_{ij} = 1$ if countries i and j share membership of a formal regional agreement; otherwise $w_{ij} = 0$. With W_4 each country has, on average, 9 neighboring countries.

Using a sample of 46 SSA countries, W_1 is relatively sparse as compared to W_2. While the sparseness is about 25 percent with W_3, it is only 19 percent with W_4.

_____

a By convention, all matrices are row-standardized as in Roberts and Deichmann (2009). $\sum_{j=i}^{N} w_{ij} = 1$.

b Mauritius, Comoros, Seychelles, Sao Tome and Principe, Cape Verde and Madagascar.

c See http://www.naturalearthdata.com/downloads/10m-cultural-vectors/10m-admin-1-states-provinces/. The matrix W_2 is calculated using the Euclidean distance.

d See https://unstats.un.org/unsd/methodology/m49/.

e The formal regional economic agreements used in the construction of matrix W_4 are: CEMAC, COMESA, ECOWAS and SADC.

Appendix 4. Moran's I Results for Global Spatial Autocorrelation

Matrices	Period	Moran's I	Mean	Z-value (prob)
W_1	2000–2004	-0.127	-0.022	-1.137 (0.128)
	2005–2009	-0.134	-0.022	-1.022(0.153)
	2010–2014	0.082	-0.022	0.96 (0.169)
	2000–2014	-0.226**	-0.022	-1.852 (0.032)
W_2	2000–2004	0.031	-0.022	0.669 (0.252)
	2005–2009	-0.159*	-0.022	-1.461 (0.07)
	2010–2014	0.016	-0.022	0.409 (0.341)
	2000–2014	-0.114	-0.022	-0.971 (0.166)
W_3	2000–2004	-0.043	-0.023	-0.414 (0.339)
	2005–2009	-0.069	-0.023	-0.817 (0.207)
	2010–2014	0.041	-0.023	1.121 (0.131)
	2000–2014	-0.071	-0.023	-0.842 (0.2)
W_4	2000–2004	0.007	-0.023	0.539 (0.295)
	2005–2009	-0.032	-0.023	-0.126 (0.45)
	2010–2014	0.061	-0.023	1.243 (0.107)
	2000–2014	-0.082	-0.023	-0.853 (0.197)

*Significance at the 10% level; **Significance at the 5% level.

Appendix 5. Moran's I Results for Global Spatial Autocorrelation by Countries

Country groupings using Matrix W_1

Country groupings	Period	Moran's I	Mean	Z-value (prob)
Angola and Neighbors	2000–2004	-0.074	-0.25	0.792 (0.214)
	2005–2009	-0.435	-0.25	-1.186 (0.118)
	2010–2014	-0.308	-0.25	-0.292 (0.385)
	2000–2014	-0.077	-0.25	0.719 (0.236)
Nigeria and Neighbors	2000–2004	-0.412	-0.25	-0.670 (0.252)
	2005–2009	-0.519*	-0.25	-1.306 (0.096)
	2010–2014	-0.32	-0.25	-0.382 (0.381)
	2000–2014	-0455	-0.25	-0.831 (0.203)
South Africa and Neighbors	2000–2004	-0.186	-0.167	-0.122 (0.451)
	2005–2009	-0.229	-0.167	-0.392 (0.348)
	2010–2014	0.012	-0.167	0.911 (0.181)
	2000–2014	-0.329	-0.167	-0.903 (0.183)

* Significance at the 10% level.
Note: Neigboring countries are selected using the contiguity definition.

Appendix 6. Results from Estimation of Spatial Panel Fixed Effects Model

To empirically assess the growth spillovers in Sub-Saharan Africa over the period 2000–2014, we estimate the following equation:

$$g = (v_T * \alpha) + X\beta + \rho (I_T * W) g + \varepsilon$$
$$\text{with } E(\varepsilon) = o \text{ and } E(\varepsilon\varepsilon') = \sigma_\varepsilon^2 I_{NT}$$

Where the dependent variable g is a $NT \times 1$ vector of country per capita growth rates; α is an $N \times 1$ vector of country-specific time-invariant fixed effects; X is a $NT \times k$ matrix of control variables; W represents the four weighted matrices; ε is the error term; and ρ is a scalar parameter capturing the strength of cross-country growth spillovers. The augmented Solow model is taken as the baseline empirical growth model. The explanatory variables include: share of investment in real GDP, population growth, primary school enrolment ratio, and logarithm of real GDP per capita. In addition, other explanatory variables that were proposed in the empirical growth literature are considered (Durlauf, Johnson and Temple 2005). To capture the macroeconomic and external environment, we use the share of government expenditure in real GDP, inflation and trade openness (Barro, 1991; Frankel and Romer, 1999). Governance variables are also considered: control of corruption and rule of law (World Governance Indicators). Studies found that governance and institutions matter in the process of economic growth. The control variables also include a measure of natural resource abundance (logarithm of natural capital per capita from the Changing Wealth of Nations dataset). The study relies on 3 non-overlapping 5-year periods to control for business cycle fluctuations during the sample period (2000–2014).

The results show no evidence of significant growth spillovers in Sub-Saharan Africa. The coefficient associated with growth spillovers is non-significant for all specifications (Appendix 6: Table 1). This result is in line with the results of Roberts and Deichmann (2009). Their results show that growth spillovers have been absent in Sub-Saharan Africa over the period 1970–2000 while between OECD countries there were strong spillovers. The degree of border restrictions and poor regional integration can mean that countries do not benefit from economic dynamics in neighboring countries.

The results also support the presence of conditional convergence as the logarithm of initial GDP per capita is negatively correlated with growth of per capita GDP. Higher human capital, population growth and trade openness as well as a better rule of law and control of corruption have positive impact on per-capita GDP growth. The abundance of natural resources has no impact.

Appendix 6: Table 1. Spatial Panel Fixed Effects Model: per capita GDP Growth in Sub-Saharan Africa, 2000–2014

Dependent variable: Per capita GDP growth	Matrix W_1		Matrix W_2		Matrix W_3		Matrix W_4	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (GDP per capita), t-1	-6.44***	-6.42***	-5.642***	-5.553***	-5.475***	-5.468***	-5.522***	-5.499***
	-1.389	-1.389	-1.241	-1.244	-1.262	-1.258	-1.271	-1.268
Pop. Growth	3.174***	2.663***	2.787***	2.395***	3.153***	2.661***	3.124***	2.58***
	-0.687	-0.686	-0.645	-0.652	-0.659	-0.653	-0.673	-0.667
Investment/GDP	0.007	0.016	0.017	0.034	0.027	0.041	0.019	0.037
	-0.035	-0.035	-0.031	-0.031	-0.032	-0.032	-0.035	-0.034
Gov. Expenditure/GDP	-0.033	-0.055	-0.062	-0.099	-0.085*	-0.114**	-0.0701	-0.106*
	-0.059	-0.059	-0.051	-0.052	-0.051	-0.052	-0.056	-0.055
Openness	0.084***	0.083***	0.085***	0.083***	0.084***	0.083***	0.084***	0.083***
	-0.0101	-0.01	-0.009	-0.009	-0.009	-0.009	-0.01	-0.01
School	0.046***	0.043***	0.044***	0.043***	0.043***	0.043***	0.042***	0.043***
	-0.016	-0.016	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015
Inflation	0.0009	0.0001	0.0005	-0.0007	0.002	0.001	0	-0.001
	-0.009	-0.009	-0.009	-0.009	-0.01	-0.01	-0.009	-0.009
Log (natural capital)	-0.63	-0.641	-0.715	-0.871	-1.155	-1.147	-1.197	-1.076
	-1.142	-1.142	-1.004	-1.002	-1.025	-1.022	-1.057	-1.058
Control of corruption	2.52**		2.608**		2.3**		2.510**	
	-1.06		-1.036		-1.026		-1.123	
Rule of law		2.97**		2.68**		2.719**		2.72**
		-1.248		-1.153		-1.158		-1.193
Wg	0.022	0.018	0.115	0.072	-0.076	-0.061	-0.0123	0.008
	-0.116	-0.116	-0.072	-0.071	-0.125	-0.124	-0.094	-0.094
N	30	30	35	35	35	35	34	34
NT	90	90	105	105	105	105	102	102
R2	0.0306	0.03	0.0257	0.0275	0.0225	0.0264	0.02	0.0246
R2-within	0.7723	0.7725	0.7519	0.751	0.7451	0.747	0.7477	0.7491

*** $p<0.01$, ** $p<0.05$, *$p<0.1$

Appendix 7. Results from Estimation of Pooled OLS Model with Fixed Effects

To assess whether economic growth in each of the three largest MICs has an impact on their neighbors, we estimate pooled regressions with fixed effects. These regressions are estimated over two periods: 1960–2016 and 2000–2014.

For each of the three MICs, Angola, Nigeria and South Africa, the dependent variable is the per capita GDP growth of SSA countries excluding the MIC. The explanatory variables are:

- Global developments: world per capita GDP growth.
- Regional developments: lagged GDP per capita, public revenue in percent of GDP, investment in percent of GDP, trade in percent of GDP, primary school enrolment, inflation, and control of corruption.
- Country-specific developments, i.e. variables specific to each of the three MICs: per capita GDP growth, investment as a percent of GDP, real exchange rate, public revenue as a percent of GDP, inflation, and imports growth.
- Dummies and interactions terms: a dummy variable if a country is a neighbor of the MIC or if a member of the same regional community and an interaction term (neighbor dummy * country per capita growth).

Results show no statistically significant evidence that growth in one of the three MICs has an impact on its neighbors or other SSA countries. Global economic growth, however, has an impact, as do increases in investment as a share of GDP and primary school enrolment rate.

Appendix 7: Table 1. Results from Pooled Regressions with Fixed Effects, 1960–2016

	South Africa		Angola		Nigeria	
	(1)	(2)	(3)	(4)	(5)	(6)
	1960–2016	1960–2016	1960–2016	1960–2016	1960–2016	1960–2016
Global developments						
World per capita GDP growth	0.301	-0.333	0.276**	0.250*	0.388***	0.363***
	(0.214)	(0.293)	(0.137)	(0.127)	(0.131)	(0.140)
Regional developments						
GDP per capita, t-1	-8.780***	-10.28***	-7.570***	-9.712***	-7.491***	-9.418***
	(1.422)	(1.781)	(1.261)	(1.571)	(1.248)	(1.637)
Public revenue/GDP	0.0582	0.0194	0.0459	0.0445	0.0754**	0.0695*
	(0.0380)	(0.0375)	(0.0374)	(0.0372)	(0.0366)	(0.0375)
Investment/GDP	0.0605**	0.0768**	0.0830***	0.0694**	0.0562**	0.0372
	(0.0278)	(0.0306)	(0.0282)	(0.0287)	(0.0263)	(0.0275)
Openness	0.0175	0.0151	0.0147	0.0140	0.0219**	0.0224**
	(0.0109)	(0.0118)	(0.0107)	(0.0107)	(0.0106)	(0.0108)
School	0.0351**	0.0349*	0.0440***	0.0288*	0.0481***	0.0316*
	(0.0159)	(0.0193)	(0.0161)	(0.0165)	(0.0152)	(0.0170)
Inflation	0.00625*	0.00514	0.00672**	0.00317	0.00537*	0.00398
	(0.00361)	(0.00374)	(0.00321)	(0.00359)	(0.00322)	(0.00423)
Control of corruption	0.841	0.921	0.483	0.817	0.785	0.947
	(0.979)	(1.023)	(0.938)	(0.944)	(0.917)	(0.954)
Country-specific developments						
Per capita GDP growth	0.0817	0.641	0.0579*	0.0623*	-0.00004	0.00675
	(0.171)	(0.482)	(0.0298)	(0.0317)	(0.0315)	(0.0331)
Investment/GDP	0.366***		-0.000730		-0.0458	
	(0.127)		(0.0152)		(0.102)	
Real exchange rate	0.0194				0.00381	
	(0.0197)				(0.00448)	
Public revenue/GDP		0.0251		0.0112		-0.000916
		(0.224)		(0.0258)		(0.0470)
Inflation		0.0711*		0.0144**		0.0151
		(0.0402)		(0.00666)		(0.00943)
Imports growth		0.0399				0.00743
		(0.0650)				(0.00642)
Dummies and interaction variables						
Neighbors of country	-13.94***	16.06***	-8.800***	-10.78***	-2.336	-14.32***
	(3.317)	(5.547)	(3.375)	(3.466)	(2.776)	(5.444)
Neighbors* country per capita GDP growth	0.189	0.188	0.0449	0.0389	0.0567	0.0621
	(0.197)	(0.198)	(0.0481)	(0.0480)	(0.0480)	(0.0494)
Constant	74.46***	63.69***	69.65***	92.94***	56.90***	74.54***
	(14.82)	(13.09)	(13.62)	(16.71)	(11.45)	(14.58)
Observations	529	486	538	538	530	512
R-squared	0.332	0.367	0.331	0.337	0.326	0.337

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix 7: Table 2. Results from Pooled Regressions with Fixed Effects, 2000–2014

	South Africa		Angola		Nigeria	
	(1)	(2)	(3)	(4)	(5)	(6)
	2000–2014	2000–2014	2000–2014	2000–2014	2000–2014	2000–2014
Global developments						
World per capita GDP growth	0.696**	0.284	0.206	0.329***	0.370***	0.234
	(0.276)	(0.406)	(0.225)	(0.122)	(0.121)	(0.159)
Regional developments						
GDP per capita, t-1	-15.50***	-17.48***	-12.67***	-17.11***	-16.31***	-15.97***
	(2.055)	(2.334)	(1.718)	(2.234)	(2.101)	(2.178)
Public revenue/GDP	0.0206	0.0223	0.00234	0.00746	0.0152	0.0254
	(0.0392)	(0.0397)	(0.0386)	(0.0378)	(0.0365)	(0.0364)
Investment/GDP	0.0647**	0.0545*	0.0829***	0.0610*	0.0499	0.0544*
	(0.0320)	(0.0324)	(0.0309)	(0.0314)	(0.0303)	(0.0303)
Openness	0.00610	0.00381	0.00172	0.000641	0.00610	0.00623
	(0.0136)	(0.0137)	(0.0133)	(0.0131)	(0.0128)	(0.0128)
School	0.0413*	0.0310	0.0623***	0.0349	0.0407**	0.0402*
	(0.0222)	(0.0231)	(0.0203)	(0.0219)	(0.0205)	(0.0210)
Inflation	0.0136***	0.00908	0.0163***	0.00823	0.00774	0.00840
	(0.00515)	(0.00562)	(0.00455)	(0.00523)	(0.00499)	(0.00512)
Control of corruption	1.292	1.536	0.887	1.411	1.694	1.597
	(1.145)	(1.150)	(1.084)	(1.086)	(1.051)	(1.052)
Country-specific developments						
Per capita GDP growth	-0.249	0.168	0.0412	0.0402	-0.0191	-0.00758
	(0.252)	(0.516)	(0.0292)	(0.0322)	(0.0305)	(0.0333)
Investment/GDP	0.442***		-0.0697		-0.203	
	(0.138)		(0.0752)		(0.142)	
Real exchange rate	0.00767				0.0531**	
	(0.0225)				(0.0233)	
Public revenue/GDP		0.226		0.0133		0.180**
		(0.234)		(0.0374)		(0.0843)
Inflation		0.0792*		0.0305***		0.0474***
		(0.0435)		(0.00973)		(0.0139)
Imports growth		0.000464				0.0105
		(0.0772)				(0.00766)
Dummies and interaction variables						
Neighbors of country	27.07***	29.75***	28.09***	37.04***	-27.43***	-26.37***
	(5.227)	(5.422)	(5.216)	(5.930)	(3.958)	(3.978)
Neighbors* country per capita GDP growth	0.204	0.169	0.0459	0.0453	0.0758*	0.0747
	(0.202)	(0.203)	(0.0456)	(0.0450)	(0.0452)	(0.0453)
Constant	93.92***	109.0***	82.13***	114.8***	138.4***	128.8***
	(14.00)	(16.01)	(12.62)	(16.28)	(18.32)	(19.46)
Observations	410	410	418	418	411	411
R-squared	0.411	0.414	0.408	0.423	0.424	0.424

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

**Reinvigorating Growth in
Resource-Rich Sub-Saharan Africa**

WORLD BANK GROUP