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Inclusive and Sustainable Structural Transformation in Africa
Forging Ahead

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Les résultats, interprétations, et conclusions exprimés dans ce rapport incombent uniquement aux auteurs et n'expriment pas nécessairement les opinions du groupe de la Banque africaine de développement, de son conseil d'administration, ou des pays qu'elle représente.

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The findings, interpretations, and conclusions in the report are entirely those of the authors and do not necessarily express the views of the African Development Bank Group, its Board of Directors, or the countries they represent.
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<td>ACET</td>
<td>African Center for Economic Transformation</td>
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<td>AfDB</td>
<td>African Development Bank</td>
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<td>AFTZ</td>
<td>African Free Trade Zone</td>
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<td>AGOA</td>
<td>African Growth and Opportunity Act</td>
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<td>AIDA</td>
<td>Accelerated Industrial Development of Africa</td>
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<tr>
<td>COMESA</td>
<td>Common Market for Eastern and Southern African</td>
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<td>CIS</td>
<td>Commonwealth of Independent States</td>
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<td>EU</td>
<td>European Union</td>
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<td>EBA</td>
<td>Everything But Arms</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>GVC</td>
<td>Global Value Chain</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GNI</td>
<td>Gross National Income</td>
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<td>HDI</td>
<td>Human Development Index</td>
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<td>HDR</td>
<td>Human Development Report</td>
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<td>ICs</td>
<td>Industrialized Countries</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<td>IMF</td>
<td>International Monetary Fund</td>
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<td>ISIC</td>
<td>International Standard Industrial Classification</td>
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<td>LT</td>
<td>Low-Technology</td>
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<td>MHT</td>
<td>Medium- and High-Technology</td>
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<td>MVA</td>
<td>Manufacturing Value Added</td>
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<td>NEPAD</td>
<td>New Partnership for Africa's Development</td>
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<td>NICs</td>
<td>Newly Industrialized Countries</td>
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<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>SADC</td>
<td>Southern African Development Community</td>
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<td>SDG</td>
<td>Sustainable Development Goals</td>
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<td>SEZ</td>
<td>Special Economic Zone</td>
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<td>RB</td>
<td>Resource-Based</td>
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<td>TFTA</td>
<td>Tripartite Free Trade Area</td>
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<td>TVET</td>
<td>Technical and Vocational Education and Training</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
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<td>UNECA</td>
<td>United Nations Economic Commission for Africa</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNIDO</td>
<td>United Nations Industrial Development Programme</td>
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<td>WDI</td>
<td>World Development Indicators</td>
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Overview

This report discusses the importance of structural transformation for sustainable and inclusive development, highlighting the role of manufacturing as a critical driver for inclusive growth and shared prosperity—and as the “single most important thing that distinguishes rich countries from poor ones.”

But structural change toward manufacturing has not happened in Africa, and the manufacturing sector’s employment, production, and exports have been weak. In fact, many African countries are deindustrializing, though individual country performances vary.

Africa also remains on the periphery in international trade, with most of its exports either commodities or resource-based and low-technology manufactured products. And its exports markets and products are highly concentrated. Such high reliance on the primary sector increases the vulnerability to external shocks, as illustrated by the recent commodity slump—which, despite pockets of resilience, has put an end to a decade-long growth spell.

There are, however, multiple opportunities to promote industrialization on the continent:

1. Africa can leverage its natural resource endowments to pursue a resource-based industrialization strategy.
2. Demand is growing for manufactured goods in Africa, which recorded the fastest growth in manufactured imports, with even some basic products, ranging from apparel to shoes and to electronics, imported on a large scale.
3. The rising labor costs and technological upgrading in large middle-income countries such as China, India, and Brazil offer an opportunity for industrialization to all developing economies with currently lower incomes (including African countries).
4. Several African countries have attracted FDI and integrated into global value chains, which could accelerate structural transformation if combined with upgrading, both economic and social.
5. Thanks to greater integration, regional markets are expanding and should allow firms to achieve the scale economies necessary for the emergence of industries competitive on the international market.

African countries must take a new path for sustainable and inclusive structural transformation. A first aspect of this change is behavioral: governments cannot continue business as usual. Strong political leadership and a national movement for changing mindsets can raise aspirations and reinforce positive values.

Structural transformation requires coordinating actions in various areas of the economy, including forward and backward linkages with agriculture and mining. It requires investing in infrastructure for energy, transport, and information and communications technology. It requires implementing reforms to improve the business environment. And it requires upgrading production technologies as well as labor and entrepreneurship skills.

To mobilize the massive amounts to fund such a structural transformation, partnerships—public or private, national or international, bilateral or multilateral—will be crucial, though a significant part of these funds can be mobilized on the continent.

To guide implementation and monitor progress, Productive Capacity Development strategies, both national and regional, will have to be carefully designed through regular dialogue with the private sector to identify problems, clear performance criteria for establishing success or failure, time-limited support for new activities, and export promotion to enhance competitiveness.
1. Introduction

GDP growth increased from just above 2% in the 1980s and 1990s to more than 5% between 2001 and 2014. This growth was second only to that in emerging and developing Asia. But the recent fall in commodity prices slowed this growth spell, with real GDP growth in Africa at 2.2% in 2016, down from 3.4% in 2015. This commodity price bust highlights the need for African countries to industrialize and diversify in order to increase their economic resilience and sustain growth.

Economic transformation and industrialization remain top policy priorities. The African Union’s Action Plan for Accelerated Industrial Development of Africa (AIDA), the Agenda 2063, and the Sustainable Development Goals all give prominence to sustainable industrialization as a prime channel to lift millions out of poverty. And Industrialize Africa is one of the African Development Bank’s High 5 priority areas, together with Light Up and Power Africa, Feed Africa, Integrate Africa, and Improve the Quality of Life of the People of Africa.1

The quest for “emergence” in Africa has also been synonymous with industrialization in a number of countries. For example, Gabon aspires to be an emerging country by 2025 through the local transformation of natural resources and the diversification of the productive base. Côte d’Ivoire aims to become an industrial power by 2040, with a focus on the agri-food industry. Uganda, in its Vision 2040, emphasized industrialization and improving its position in global value chains for agricultural products.2

This report discusses industrial development in Africa, restricting the term “industry” to manufacturing, unless otherwise specified, and structural transformation is mostly understood as industrialization.

2. Structural transformation toward manufacturing matters

Structural change refers to long-term persistent changes in the composition (relative importance) of sectors in an economy. It can be defined as a move from low-productivity, low-technology, and labor-intensive activities in traditional sectors such as agriculture, toward higher productivity, high-technology and skill-intensive activities of the modern sector, typically dominated by manufacturing and services. Such a broad definition clearly oversimplifies the economic reality. Agriculture can be high-productivity and high-tech thanks to precision farming, automation, or genetic engineering. Similarly, informal manufacturers or traders can have low productivity and skills, keeping them small and inefficient.

Structural transformation can be analyzed from several perspectives, such as sectoral shifts in economic structure, technological upgrading (within sectors), and diversification.3 The first perspective relates to the move from traditional agricultures toward the “modern” sector, specifically manufacturing and services. It is crucial primarily for countries at low incomes, which need to align their agricultural and industrial policies, increasing productivity in agriculture. Technological upgrading, relevant mostly for middle income and emerging countries, refers to efficiency and productivity improvements in labor-intensive and low-tech sectors to increase competitiveness—and toward more technologically advanced products and sectors. As income grows, countries find it difficult to compete in even technologically advanced but mature sectors or subsectors, requiring innovation and differentiation as a competitiveness strategy.

Diversification can be defined as the increasingly equal distribution of production, employment, or exports across sectors, subsectors, or markets. Product diversification depends on a country’s incomes and follows an inverted U-shape (Imbs and Wacziarg 2003). From low incomes, diversification should increase until reaching about US$9,000 per capita, subsequently followed by increased specialization. A diversified industrial and export base facilitates the entry and exit of firms,
enhancing competitiveness and productivity through the elimination of less competitive firms (Hausmann and Rodrik 2005), while making exporters less vulnerable to outside shocks.

Sustained and inclusive development requires structural change, and since the industrial revolution, manufacturing has been at the core of structural change, consistently creating higher output and employment, and leading to an unprecedented growth in incomes (UNIDO 2013). Three main reasons can explain the role of manufacturing as a critical driver of inclusive growth and shared prosperity (Smirzai 2012).

- First, a vibrant manufacturing sector stimulates technological change with the adoption, mastery, and development of improved production processes and new technologies, boosting productivity throughout the economy. In contrast to agriculture and extractive activities that are limited by resource endowments, the growth potential in manufacturing is virtually unlimited thanks to agglomeration and possible economies of scale from new inventions and technological development.
- Second, manufacturing promotes economic growth through forward and backward linkages. The growth of one manufacturing subsector can thus fuel the development of other related sectors and such support sectors as finance or transport.
- Third, as per capita incomes rise, the share of spending on manufactured goods increases (Engel’s law).

Industrialization is therefore necessary for African countries to benefit from expanding markets for manufactured goods, which make up more than 80% of world merchandise exports. If successfully implemented, it will lift and keep millions of people out of poverty, thus contributing to the achievement of the SDGs (SDG 1 in particular).

Cambridge economist Ha-Joon Chang summarizes the importance of manufacturing for economic growth: “History has repeatedly shown that the single most important thing that distinguishes rich countries from poor ones is basically their higher capabilities in manufacturing, where productivity is generally higher, and, most importantly, where productivity tends to (although does not always) grow faster than in agriculture and services” (Chang, 2007:213).

3. Africa’s manufacturing sector performance is mixed

In this section we analyze the performance of the manufacturing sector on two aspects: manufacturing production and manufacturing exports.

Manufacturing employment

Manufacturing—broadly defined to include formal, informal, and manufacturing-related services—employed almost 470 million workers in 2009, around 16% of the world’s workforce of 2.9 billion (UNIDO 2013). The share of developed countries in manufacturing employment has fallen substantially over the last 43 years (Haraguchi et al. 2016). Such a deindustrialization, unsurprising for countries at high incomes, is not normal for countries at low incomes.

The move of manufacturing jobs away from developed countries has not yet benefited African countries. In 2012, about 65% of world manufacturing jobs were in Asia, compared with 9% in Latin America and almost 6% in Africa. In 2016, Central Africa accounted for 2% of manufacturing jobs; Southern Africa for 19%, Eastern Africa for 25%, Western Africa for 25%, and North Africa for 29%. Within the continent as shown in Figure 1, Eastern Africa has recorded the highest level of increase in the share of manufacturing employment in total employment (from 2.7% in 1991 to 6.9% in 2012); followed by Western Africa, which reached a dip in 1999 (at 4%) before reaching 5.8% in 2012. Between 2009 and 2012 the share of manufacturing employment in total employment declined in Central and Northern Africa, while slightly increasing in Southern Africa. Manufacturing jobs are also concentrated on the continent,
with Algeria, Egypt, Ethiopia, Ghana, Kenya, Morocco, Nigeria, and South Africa accounting for more than 70%.

**Figure 1. Manufacturing employment shares in Africa and its subregions, 1991–2012**

Creating more manufacturing jobs is essential for growth-enhancing structural change. But in Africa, industrial jobs (manufacturing and non-manufacturing) have increased only marginally (figure 2), while labor has moved primarily from agriculture to services, typically into the informal sector where firms are small and inefficient (La Porta and Shleifer 2014). Agriculture’s share in employment (about 55% in 2010–2012) contrasts with its contribution to GDP (around 15% in 2010–2012). Clearly, increasing agricultural productivity will be essential for the transition toward industrialization (manufacturing) in Africa.

Manufacturing jobs are growth-enhancing as they are likely to be more productive and better paid than jobs in other sectors (UNIDO 2013). In addition to direct employment, manufacturing creates indirect employment due to strong linkages with other sectors, particularly services. For example, manufacturing firms are increasingly outsourcing their noncore operations, such as warehousing, transport, human resource management, and information technology. And manufactured products are being bundled with a host of services and after-market functions, such as telephone help-lines, extended warranty and repair, and retail services. Such “outsourced” service firms provide services to several manufacturing firms, improving their efficiency.
Figure 2. Structural transformation in Africa, 1991–2012

Source: Own calculations, based on Haraguchi et al. (2017) and AfDB (2017).

**Manufacturing production**

Africa’s share of manufacturing value added (MVA) in GDP fell from 12.8% in 1990 to 9.9% in 2010, before picking up slightly to 10.4% in 2015 (figure 3). A similar overall decline is observed in Latin America, where the share of MVA in GDP declined from 16.6% to 13.4% between 1990 and 2015. In contrast, developing Asia and Europe increased the contribution of MVA to GDP between 1990 and 2015: from 16.5% to 25.5% for Asia, and from 14.8% to 15.2% for Europe. The share of MVA in GDP declined the most in Southern Africa, from 16.7% in 1990 to 11.2% in 2015; while it hovered between 10% and 12% in Northern Africa. It fell in Eastern and Central Africa, but it seems to have picked up in Western Africa around 2010, coinciding with the end of conflict in Côte d’Ivoire.
Manufacturing has generally been expanding in absolute terms (figure 3), and the level of MVA in Africa reached US$233 billion (constant 2010) in 2015, having grown 4.2% a year between 2010 and 2015, a rate second only to Asia (7.0%). This MVA growth was higher than that of GDP (at 3.3%) in 2010–2015, suggesting that manufacturing has been an engine of growth, especially in Western Africa, where MVA grew 11.6%. The largest producers on the continent were South Africa (22.3%), Nigeria (20.1%), Egypt (17%), and Morocco (6%). But despite growing faster than the world average, at 3.8% in 2005–2010 and 4.2% in 2010–2015, Africa’s MVA remains less than 2% of world MVA. Africa has also the lowest MVA per capita across regions at US$202 (constant 2010) up from US$186 in 2011; much lower than Asia (US$952) or Latin America (US$1,219).

Some countries have been fairly successful. Nigeria and Ethiopia recorded the fastest growth rates between 2010 and 2015, with MVA per capita growing respectively at 11.3% and 9.3%; followed by Equatorial Guinea (5.8%), Burkina Faso (4.4%) and Niger (4.3%). In contrast, Libya and Central African Republic recorded the largest declines, mainly due to conflicts. MVA per capita in Côte d’Ivoire declined by 0.6%, while in South Africa, the country with the highest MVA per capita in 2015 at US$971, it grew by 0.4%. Although the high growth rates in several countries is encouraging, it is important to put them into perspective, given the initial low MVA per capita. For example, using 2015 data, 11.3% growth in Nigeria would add US$29 (constant 2010) to its MVA per capita, while 3% growth in Malaysia would add US$75 (constant 2000). Angola, Botswana, and Mauritius have high MVA and high growth (figure 4). Countries such as South Africa, Côte d’Ivoire, and Senegal also have achieved high MVA per capita, but are experiencing slower industrial growth. Of several countries with a low industrial base but significant growth, Ethiopia is the second fastest growing with MVA growth of 9.3% over 2010–2015. This remarkable rate is attributable to the government’s leadership in addressing market failures and promoting growth in the leather industry, drawing on industrial policy inspired by East Asian countries such as Korea and Taiwan-China. Countries with declining MVA per capita from already relatively low levels, such as Benin, Malawi, and Sierra Leone, face the most serious challenges in stimulating industrial development, and deliberate government intervention may be essential to place them on the path of sustained industrialization.
Figure 4. MVA per capita, five-year average 2011–2015 (2010 US$)

Source: Own calculations, based on UNIDO (2016).
What would it take for countries to reach the 2015 MVA per capita of such emerging countries as Chile, China, Thailand, or Turkey? Among those countries, Nigeria could reach Chile’s 2015 MVA per capita around 2037, while Gabon would reach it around 2045 (figure 5). No other country in the African group would reach Chile’s 2015 level within the timeframe to 2052. Despite sustained MVA growth rates, African countries still lie far behind others, and their current industrial growth rates are typically not fast enough to quickly catch up with other countries.

Figure 5. Simple MVA per capita projections for selected African countries

Source: Own calculations, based on UNIDO (2016).

**Manufactured exports**

African countries mainly export primary products, 62% of Africa’s total exports, the highest among world regions (figure 6), leaving 38% for manufactured exports. Western Africa has the highest share at 79%, with Southern and North Africa having the lowest, at 55% and 53% respectively. Among the large regional African countries, Algeria, Angola, and Nigeria are above 75%, driven mainly by unrefined oil and gas exports. Kenya (52%), Egypt (67%), and South Africa (72%) have the highest shares.
Africa’s manufactured exports grew 14.3% between 2006 and 2010, above the world average (5.3%), but slowed to 3.3% in 2010–2014, slipping below world average growth at 5.5%. Africa had the lowest manufactured exports per capita among world regions at US$218 (current values) in 2014, compared with US$883 (current values) in Asia and US$1,099 (current values) in Latin America. The share of Africa’s manufactured exports in world manufactures exports has been less than 1.5% since 2000, reaching its highest level (1.5%) in 2010.

The technological structure of manufactured exports is biased toward resource-based and low-technology manufacturing (figure 7). The share of resource-based and low-technology exports in South Africa is 55.2%, the lowest in Africa but above the emerging-country average (43.9%). Resource-based and low-technology exports make up more than 80% of exports in Algeria, Angola, and Nigeria. These categories typically include food and beverage manufactures, wood products, textile articles, and construction materials such as lime and cement.

Source: Own calculations, based on UN (2016).
A notable feature of Africa’s exports is their concentration, in both products and markets. In 2014, Africa’s aggregate Herfindhal index was 0.25 for products and 0.10 for markets, compared with 0.13 and 0.13 for Asia, and 0.05 and 0.11 for industrialized countries. Although trade can be a powerful engine of growth in Africa, countries will have to diversify away from primary commodities, from their products and markets.

Countries such as Angola and Botswana have above-median product and market concentrations (figure 8). Petroleum products account for more than 90% of Angola’s manufactured exports, with more than 80% absorbed by China. Pearls and precious stones represent more than 80% of Botswana’s exports, with the top four trading partners—Belgium, India, South Africa, and Israel—accounting for 60% of total manufactured exports. Other countries in the high-high quadrant, such as Central African Republic, Gambia, and Niger, have around three products accounting for more than 80% of total manufactured exports, and the top three trading partners accounting respectively for 91%, 78%, and 70% of total manufactured exports.

The low-high quadrant groups countries with diversified product exports but above-median market concentration, among them Mali, Mozambique, and Zambia. Countries in the low-high quadrant are typically characterized by high product concentration, with more than 80% of exports earnings in Guinea from aluminum ore in 2014, and 88% of manufactured exports in Algeria from petroleum and gas products. The low-low quadrant has countries such as Kenya, South Africa, and Egypt, among the most diversified in Africa, in both markets and products.

Figure 8. Market and export diversification, five-year average, 2010–2014

Source: Own calculations, based on UN (2016).
About 60% of Africa’s manufactured exports go to countries outside the continent. However, some of the top trading countries (mainly landlocked, such as Rwanda, Burundi, and Burkina Faso) export mainly to neighboring countries on the continent (more than 80%). In 2014, 67% of Zimbabwe’s manufactured exports went to South Africa. Gambia traded mostly with Mali (38%), Guinea (25%), and Senegal (16%). Likewise, Uganda traded primarily with Kenya (14%), South Sudan (13%), and Rwanda (12%).

A promising approach to expand and diversify their manufacturing exports would be to target other African countries (South Centre 2010); as intra-African exports appear more elaborated than those to Europe or North America, thus presenting more growth-enhancing and learning opportunities (Kingler 2009).

Although manufacturing technologically advanced products may be challenging, a developing country can reap exports benefits by investing in dynamic export sectors—those with the highest growth rates or the potential for growth in world merchandise exports. In doing so, a country can limit the risk of export market saturation due to high competition and harness the potential for long-term productivity growth associated with an export-oriented industrialization strategy (Mayer, Butkevicius, and Kadri 2003). In 2010–2014, the average share of dynamic exports in Africa’s total exports was about 5.3%, compared with 10.8% in Latin America and 16.3% in Asia. This is puzzling since 10 of the 20 most dynamic products are resource-based or low-technology products, and seven others are in medium-technology (table 1). African countries could benefit from high demand in such sectors as high-value crops (fruits and vegetables) and by adding some value to their agricultural products (cocoa, leather).

Table 1. World's most dynamic manufactured exports above US$20 billion, 2010–2015

<table>
<thead>
<tr>
<th>Product</th>
<th>Technology category</th>
<th>World average annual growth rate 2010–2015 (%)</th>
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<tbody>
<tr>
<td>Lighting fixtures</td>
<td>Medium-technology</td>
<td>16.3</td>
</tr>
<tr>
<td>Aircraft associated equipment</td>
<td>High-technology</td>
<td>8.9</td>
</tr>
<tr>
<td>Watches and clocks</td>
<td>Medium-technology</td>
<td>8.2</td>
</tr>
<tr>
<td>Road motor vehicles</td>
<td>Medium-technology</td>
<td>8.1</td>
</tr>
<tr>
<td>Trunks, suitcases, bags</td>
<td>Low-technology</td>
<td>7.4</td>
</tr>
<tr>
<td>Gold, silverware, jewelry</td>
<td>Low-technology</td>
<td>7.2</td>
</tr>
<tr>
<td>Fruit, preserved, prepared</td>
<td>Resource-based</td>
<td>6.9</td>
</tr>
<tr>
<td>Medicines</td>
<td>High-technology</td>
<td>6.7</td>
</tr>
<tr>
<td>Insecticides</td>
<td>Medium-technology</td>
<td>6.4</td>
</tr>
<tr>
<td>Edible products</td>
<td>Resource-based</td>
<td>5.9</td>
</tr>
<tr>
<td>Telecom equipment parts</td>
<td>High-technology</td>
<td>5.8</td>
</tr>
<tr>
<td>Mineral manufactures</td>
<td>Resource-based</td>
<td>5.7</td>
</tr>
<tr>
<td>Medical instruments</td>
<td>Medium-technology</td>
<td>5.4</td>
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<tr>
<td>Metallic structures</td>
<td>Low-technology</td>
<td>5.4</td>
</tr>
<tr>
<td>Non-alcohol beverages</td>
<td>Resource-based</td>
<td>5.3</td>
</tr>
<tr>
<td>Household equipment</td>
<td>Low-technology</td>
<td>5.1</td>
</tr>
<tr>
<td>Trailers, semitrailers</td>
<td>Medium-technology</td>
<td>5.1</td>
</tr>
<tr>
<td>Articles of plastics</td>
<td>Low-technology</td>
<td>5.1</td>
</tr>
<tr>
<td>Mechanical handling equipment</td>
<td>Medium-technology</td>
<td>4.8</td>
</tr>
<tr>
<td>Chocolate, other cocoa</td>
<td>Resource-based</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Source: Own calculations, based on UNIDO (2016).
4. Multiple opportunities

Positive signals about industrialization in Africa include an underexploited agro-industrial potential, a growing demand for manufactured goods, and a strengthening of regional integration.

Using the primary sector for resource-based industrialization

Africa is well positioned to pursue a resource-based industrialization strategy. It has more than US$82 trillion in discovered natural resources, which are expected to contribute more than US$30 billion a year in government revenues over the next 20 years (AfDB 2016b). It has about 30% of all global mineral reserves, including 40% of gold, 60% of cobalt, and 90% of platinum. It possesses a quarter of the world’s arable land, the second largest and longest rivers (the Nile and the Congo), and vast forests. The value added of its fisheries and aquaculture alone was estimated at US$24 billion in 2011 (de Graaf and Garibaldi 2014).

The low value addition through processing deprives Africa of vast revenues. For example, Africa exports 69% of the world’s raw cocoa beans, but only 16% of ground cocoa, which is typically worth 2–3 times more per ton than raw cocoa (AfDB 2016c). Similarly, African countries process only 56% of the soybeans they produce, meeting further demand for processed soy through expensive imports. These examples easily extend to coffee, tea, or other agricultural commodities. Agribusiness can thus be the engine of Africa’s structural transformation while creating decent nonagricultural jobs, increasing income, feeding Africa, and alleviating poverty. Transforming the agriculture sector in Africa toward agro-allied industrialization could open markets worth more than US$100 billion a year by 2025 (AfDB 2016c).

Mining resources present a real opportunity to build manufacturing industries. Forward and backward linkages can be created between the extractive industry and other sectors of the manufacturing industry by favoring the production of inputs and services to meet the demand of the extractive industries. But many African countries lack the capability to collect enough revenues from multinationals, particularly those in natural resource extraction. Compounding the problem, the collected resources typically are not well managed.

Demand for manufactured goods is growing

Africa recorded the fastest growth in imports of manufactures (141% in absolute terms) with an increase in its share of total world imports by 1 percentage point to 3.2% over 2005–2014 (Balchin et al. 2016). Yet, African economies are remarkably import-dependent for even basic products, ranging from apparel to shoes to electronics.

Supporting imports is an African middle class in search of manufactured food, housing, clothing, and equipment of higher quality than those produced in Africa. The middle class rose from 27% of the population in 1980 to 34% in 2010, representing about 350 million people (Mubila and Aissa 2011; Abebe and Neube 2015). Consumer spending by the middle class was estimated at US$680 billion in 2008, and could reach US$2.2 trillion a year in 2030. Africa’s growing urbanization is also expected to sustain demand for manufactured goods since urbanization is generally accompanied by a shift in consumption patterns toward manufactured goods. The share of the African population in cities is projected to rise from 40% in 2009 to 70% in 2050.

Africa is attracting more FDI into manufacturing

Rising labor costs and technological upgrading in large middle-income countries such as China, India, and Brazil offer an opportunity for industrialization to all developing economies with lower incomes (Lin 2011). For example in China, manufacturing wages increased from just over US$150 a month in 2005 to around US$350 in 2010. Partly in response to such a rise, China is upgrading its manufacturing production away from low-skilled manufacturing jobs, potentially freeing up nearly 100 million labor-intensive manufacturing jobs. The trend is similar in other
middle-income growth poles. China’s outward foreign direct investment in Africa has grown from US$9 billion in 2009 to US$32 billion in 2015, making China the fourth largest investor in Africa after the United Kingdom (US$66 billion), United States (US$64 billion), and France (US$52 billion), with increasingly important portions to manufacturing.

The share of manufacturing in announced greenfield FDI projects in Africa was about 26% in 2015, second to services (52%) but ahead of mining (22%) (UNCTAD 2016). The manufacturing sectors receiving the largest shares of FDI are food and beverages; coke, petroleum products, and nuclear fuel; chemicals and chemical products; and motor vehicles and other transport equipment. Some countries have been fairly successful in attracting FDI to their manufacturing sector thanks to deliberate industrial policies. For example, Ethiopia received US$2.2 billion in 2015 from textile and garment firms in Bangladesh, China, and Turkey relocating their production bases to serve the European Union (EU) and North America. Kenya received up to US$1.4 billion in 2015, with FDI targeting oil and gas exploration but also manufacturing exports, and consumer goods and services. The African auto industry announced green-field capital amounting to US$3.1 billion in 2015 in Morocco (PSA Peugeot-Citroen and Renault, France; and Ford, United States), South Africa (Volkswagen and BMW, Germany); in Nigeria (Honda, Japan); Kenya (Toyota, Japan); and Egypt (Nissan, Japan).

The examples show that Africa can become a manufacturing production hub if countries formulate and implement a viable strategy to capture the new investment opportunities and move onto a dynamic path for industrialization.

**Regional integration is expanding markets**

In Africa, 30% of countries are landlocked (16 of 54) and the majority have domestic markets that are too small and fragmented to achieve the economies of scale necessary for the emergence of industries that are competitive on the international market. Yet the potential for integration remains underutilized, despite positive trends in recent years. Indeed, regional communities and African institutions are increasing efforts to promote regional integration. The “Tripartite Free Trade Area” (TFTA) resulting from the merger of the Common Market for Eastern and Southern African (COMESA), the East African Community (EAC), and the Southern African Development Community (SADC) gave birth to the largest free trade area in Africa in 2015. It covers 26 of 54 African countries, with a market of 530 million people and a combined GDP of US$630 billion, or 53% of Africa’s total GDP. In the longer run, the African Free Trade Zone, supported by the African Union, is expected to create an economic community of more than one billion people.

Between 2000 and 2014, intraregional trade in Africa increased from 10% of total trade in the continent to 16%, still below that of Asia (55%) and Europe (70%). Such a low rate is due not only to tariff and nontariff barriers to intracontinental trade in Africa, but also to barriers to the free movement of persons. According to the Africa Visa Openness Index Report, Africans need visas for 55% of countries within Africa. Even so, Africa’s intraregional trade is more diversified than that with the rest of the world, and some two-thirds of it is in manufactures. African countries can therefore use their peers as a testing ground while building their competitiveness for exports. The share of intra-African manufacturing exports in the total value of African manufacturing exports increased by nearly 15 percentage points, from 20% to 34% between 2005 and 2014 (Balchin et al. 2016).

Regional and GVC integration in Africa will be supported by one of the African Development Bank’s top 5 priorities: “Integrate Africa,” which focuses on the movement of goods and services and the mobility of people. The African Development Bank aims to create larger, more attractive markets, link landlocked countries to regional and international markets, and support intra-African trade to foster the continent’s development. Integrate Africa will focus on addressing the
barriers separating African countries, creating regional value chains, and leveraging complementarities to exploit the continent’s huge market potential. These regional value chains will rest on local and innovative entrepreneurs who remain committed to the local economy despite economic difficulties. For example, Mauritian entrepreneurs were instrumental in offsetting the withdrawal of Asian investors after the end of the Multi-Fiber Agreement, keeping the garment industry afloat.

Regional integration should enable regional value chains to build some parts of a product in Burkina Faso and Côte d’Ivoire, and move them quickly to Nigeria where the final product will be assembled and exported to the rest of the world, just as is done in Asia and Europe. Building such regional value chains calls for regional industrial strategies, which have to deal with national sovereignty, national private sector interests, international coordination of investments, scope of planned interventions, and the development level of members (McCarthy 2014). Some regional economic communities have embarked on regional industrial policies but the process is at an early stage. For example, the West Africa Economic and Monetary Union (WAEMU) adopted a regional industrial policy in 2010 to promote structural change and industry, building on each member’s comparative advantages and exploiting complementarities. And in 2013–2014, the Southern Africa Development Community (SADC) finalized its regional industrial policy.

**Participation in global value chains is on the rise**

GVC integration could accelerate structural transformation in Africa if combined with technological and individual upgrading (AfDB 2014). Global value chains (GVCs) optimize sourcing strategies by separating production stages that can be localized in different countries. To industrialize, a country need no longer develop the domestic capacity to perform all major stages of complex manufactured products. Instead, by integrating in a GVC, a country can focus on developing productive capabilities in a specific step of a product’s value chain without having other capabilities in place (Cattaneo et al. 2013). Insertion in GVCs generally strengthens the local economy through knowledge transfer, product differentiation, and upgrading participation in GVCs. Economic upgrading must also be linked to social upgrading to become inclusive, through skill upgrading, job creation, and improved employment conditions (Bernhardt 2013).

Africa catches only 2.2% of GVCs (AfDB 2014). This low participation can be explained by the lack of the main drivers of participating and upgrading in GVCs—which are both country- and value chain-specific. At the country-level, many African countries lack adequate skills, productive capacity, and infrastructure to meet the high competitiveness standards that regional and global markets require. For example, dairy products require reliable cold chains and collection structures, while horticulture (fresh-cut fruits, vegetables, and flowers) demands efficient access to air freight given the short life cycles. Even so, Ethiopia, Kenya, Morocco, Seychelles, South Africa, and Tanzania have managed to make strides into GVCs. The integration to global value chains is led by manufacturing, ahead of agriculture and business services.

For some African countries, especially LDCs, preferential access to large markets for manufacturing exports provided opportunities to attract FDI and integrate into GVCs. Such preferential access programs include AGOA, which allows tariff- and quota-free access to the US markets for exports from a few Sub-Saharan countries. And the Everything But Arms (EBA) allows duty- and quota-free exports to the EU for Least Developed Countries (such as Ethiopia, Lesotho, and Rwanda). But these preferential access programs remain underexploited. For example, 80% of total AGOA exports to the United States in 2013 came from only three countries: Angola, Nigeria, and South Africa. And the current international environment may pose a number of additional challenges to manufactured export growth in African countries (South Center 2010), particularly the pressure from Western partners to adopt liberalization policies or to enter free trade agreements with more advanced countries. By foregoing tariff resources without being able to replace them with higher fiscal revenues, African countries
already facing dis-industrialization, could further erode their productive capacity while depriving their governments of resources to support economic transformation.

**Emerging industries can be entered**

UNIDO (2013) defines “green industry” as “a pattern of industrial production and development that does not come at the expense of the health of natural systems and does not lead to adverse human health outcomes. It consists of an industrial system that does not require an ever-growing use of natural resources and pollution to fuel societal progress.” Putting industrial development on a green path can be done in two ways: adopting greener resources, processes, practices, and products in the manufacturing sector; and developing green industries as part of the manufacturing sector (UNIDO 2011).

Green industry offers industrial development opportunities for African countries through new technologies to improve production efficiency or to reduce the generation of waste and emissions—or relative to manufacturing and service sectors that directly contribute to the transition to a green economy, through developing, manufacturing, and installing green technologies such as solar panels and wind turbines, as well as recycling or managing waste. Green industry can be part of efforts to minimize climate change discussed at the COP21 in Paris, with the non-binding goal to provide US$100 billion per year by 2020 (until 2025) in aid to developing countries for climate change adaptation and mitigation.

Although not discussed in detail in this report, services or “industries without smokestacks” are also gaining significance as part of the global industry and this trend is likely to continue. Services have historically been considered as nontradable, but they are increasingly offering export opportunities thanks to technological changes and falling transportation and communication costs (Newmann et al. 2015). Modern services include ICT and financial services; while traditional services relate to travel, tourism, and transport. Thanks to their mastery of global languages such as Arabic, English, or French, African countries possess excellent assets for communication-based services such as call centers and data transcription services. The interdependency between services and industrial activities is now characteristic of structural transformation, as many service activities—such as market and technical research, development and design, human resource management, and business consulting, financing and distribution—are necessary for or complementary to manufacturing (Pilat and Wolf 2005; UNIDO 2013).

In today’s fourth industrial revolution, the speed of innovation and the extent of disruption are hard to comprehend or anticipate. The breadth and depth of these changes are almost unlimited thanks to emerging technologies in fields such as genetics, nanotechnology, biotechnology, Internet of Things, autonomous vehicles, 3-D printing, materials science, artificial intelligence, robotics, and quantum computing. But with its current level of research and development, the continent is poised to be a latecomer to the fourth revolution, as it was for the first three revolutions. In 2013, gross expenditure on research and development (GERD) as a share of GDP was about 0.45% in Africa, compared with 2.71% in North America, 1.03% in Latin America and the Caribbean, 1.75% in Europe, and 1.62% in Asia, with Southeast Asia leading with 2.1%. Africa was home to 2.4% (1.1% for SSA and 1.4% in North Africa) of researchers in the world, compared with 18.5% for North America, 3.6% for Latin America and the Caribbean, 31% in Europe (22.2% in the EU), and 42.8% in Asia (36.9% for Southeast Asia). The share of researchers in countries such as France (5.4%), Germany (4.6%), and Korea (4.1%) is larger than that of the African continent as a whole, with the leaders China and the United States respectively at 19.1% and 16.7% of world researchers. To effectively participate in the knowledge economy that will drive the fourth industrial revolution, African countries need to rapidly build skills in sciences, ICT, engineering, manufacturing, and mathematics (the drivers of future jobs) while accelerating investments in research and development.

Despite the overall unreadiness for the fourth industrial revolution, Africa has made advances in digital and mobile technology, disrupting banking, retail, and telecommunications. This was
particularly so for the mobile money transfer platforms, pioneered by M-Pesa, which has helped improved financial access of urban and rural households in Kenya. Innovations in digital and mobile technology are impacting not only the service sectors, but also the productive sector. In agriculture, mobile phones allow farmers to access crop prices to increase their bargaining position. Mobile technology can also provide farmers with information on farming practices, crop diseases, and weather—for better crop management. Investments in high-speed internet and the spread of smartphone across Africa should make it possible for Africa to continue innovating digital and mobile technology.

5. Some key bottlenecks must be removed to unleash potential

The most common constraints on industrial development in Africa relate to deficits in infrastructure, skilled labor, finance, and the business environment.

*Bridging the infrastructure deficit*

Infrastructure services in Africa cost twice as much on average as those in other developing regions (Foster and Briceno-Garmendia 2010). And they have depressed firm productivity by as much as 40% (Escribano et al. 2008; AfDB 2014). Modern transportation systems (road, rail, and freight) are necessary for providing a cheap way of moving raw materials to producers and manufactured goods to consumers, increasing manufacturing competitiveness. East Asian firms save close to 70% in transportation costs relative to their African counterparts, while Latin American and South Asian firms save approximately 50%. Such high transportation costs act as a binding constraint to industrialization in Africa.

Infrastructure deficiencies account for 30% to 60% of the negative effects on the productivity of firms in Sub-Saharan Africa, and 40% to 80% of this is due to the energy sector in half the countries (Escribano et al. 2008). Poor energy quality imposes additional costs on companies such as idle workers, spoiled materials, lost production, damaged equipment, and restart costs. Between 2010 and 2016 in Sub-Saharan Africa, there were on average 8.5 power outages a month, with an average duration of 4.1 hours. The cost of power outages is estimated at 5.4% of annual sales (figure 9). To deal with these cuts, 51.3% of firms use their own generators for about 13.4% of their electricity consumption, increasing their costs.
Preliminary and partial AfDB estimates suggest that Africa’s annual infrastructure investment needs amount to at least US$100 billion. Fortunately, African countries are now heavily investing in infrastructure in order to close the gaps and increase their competitiveness. Efforts in the energy sector will be supported by one of the Hi-5s of the African Development Bank: Light Up and Power Africa. Under this priority area, the Bank will invest US$12 billion of its own resources in the energy sector over the next five years, while leveraging additional financing. Over the subsequent five-year period the Bank’s operations will ramp up to around US$8 billion a year.

Through the New Deal on Energy for Africa—a partnership-driven effort with the goal of achieving universal access to energy by 2025—the Bank is working to unify existing efforts to light up and power all of Africa. The New Deal aims to increase energy production, scale energy access and improve affordability, reliability, and energy efficiency while boosting the sustainability of energy systems. To achieve these goals, the Bank is working with governments, the private sector, and bilateral and multilateral energy sector initiatives to develop a Transformative Partnership on Energy for Africa—a platform for public-private partnerships for innovative financing in Africa’s energy sector. While contributing to building energy infrastructure, the Bank will also help modernize road, rail, and freight transport systems as well as information and communications technology infrastructure.

**Building human capital**

Human capital refers to knowledge, skills, and abilities that increase the productivity of individuals. It includes not only education and experience, but also health and nutrition. The indicator most commonly used to measure human capital is the human development index, a composite index of health (life expectancy at birth), knowledge or level of education (mean years of schooling and expected years of schooling), and a decent standard of living (GNI per capita).
Africa, with an index of 0.524, lags behind other regions (figure 10), it has only five countries in the high human development group (Mauritius, Seychelles, Algeria, Libya, Tunisia) and 12 in the medium human development group (UNDP 2015).

Figure 10. HDI values, Africa region and selected African countries

By 2060, the African population is expected to reach 1.6 billion, more than 70% of whom will be under 30 years of age. This demographic structure can be turned into an economic dividend if this abundant workforce is endowed with the appropriate skills. So, investment in human capital must be a priority for developing countries aspiring to transform the structure of their economies.

A poorly skilled and educated labor force is typically the top constraint mentioned by global executives when considering manufacturing investment decisions in Africa (ACET 2014). Indeed, economic transformation requires a healthy and educated workforce equipped with high-quality and relevant skills to be highly productive and innovative in processes, products, services, and technologies. Unfortunately, there are too few scientists and engineers in sectors that drive African economic transformation. For example, the share of students in Engineering, Manufacturing, and Construction programs was as follows: Burundi (3% in 2010), Cameroon (4.3% in 2010), Mozambique (4.5% in 2011), Madagascar (5.6% in 2010), Ghana (5.9% in 2015), Burkina Faso (7.3% in 2012), Morocco (12.8% in 2010), compared with Germany, Austria, Mexico, and Malaysia, all above 20% in 2014 or 2015.

Source: Own calculations, based on UNDP (2015).
Vehicles include... among the top 10 economies that have most improved the “Doing Business” report, the business environment has improved considerably in recent years. According to the 2016 Improving the... of quality personnel for the industrial sector.

- Improving the education system in Africa: the AfDB projects, policy and technical advice have generally contributed to:
  - **Increasing access to education and training** vehicles include scholarship programs and infrastructure development for basic service delivery and for skills development in priority economic sectors (such as Côte d’Ivoire, Kenya, Malawi, Equatorial Guinea, and Senegal).
  - **Improving quality and relevance of education** for labor market through support for quality assurance frameworks; capacity development of faculty; furniture and equipment with learning materials; connectivity; involvement of industry in training and internship programs; and strengthening labor market information systems (Côte d’Ivoire, Morocco, Rwanda, Zambia).
  - **Revitalizing scientific research** through competitive funds; faculty exchange; joint research programs; business incubators for research products and public-private partnerships; knowledge transfers programs; policy frameworks for scientific research (the higher education regional projects in WAEMU, ECOWAS, EAC, and individual projects in countries such as Angola, Nigeria, or Rwanda).
  - **Fostering regional integration in Africa** through support to regional centers of excellence and networks of knowledge in sectors such as ICT, water and energy sciences, biomedical sciences, and extractives and minerals (projects in Burkina Faso, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, and serving various regional economic communities).

Going forward, the Bank will implement its Jobs for Youth Strategy 2016–2025 in parallel with a strong education program by supporting African countries to reverse the structural weaknesses their education systems face. The Bank will also intensify its support through two key flagship programs to improve access, quality, governance, and relevance of education systems in Africa:

- **Rethinking education and learning for Africa's transformation** will help African countries rethink their education systems holistically and improve value for money in education expenditures in order to produce skilled graduates to meet national development needs.
- **Boosting science, technology, and innovation in Africa** will support African countries’ efforts to develop national STI policies, scientific research, TVET programs, and research to find solutions to national and regional development challenges. The aim is for Africa not to be left behind by the fourth industrial revolution. This program will be anchored in priority sectors such as agriculture, energy, ICT, infrastructure, pharmaceuticals, nutrition, and green and blue economies.

The skills required for transformation should go beyond formal schooling to combine on-the-job training and apprenticeships as in technical and vocational educational training (TVET). For instance, in Mauritius, TVET represents about half of secondary school enrolment and provides skills to lower and middle level technicians (UNECA 2015). The TVET system should also work more closely with the government and the private sector to develop and strengthen a curriculum that matches business needs, since the skill mismatch in Africa is a significant constraint on firms across the continent (Shimeles 2016). In sum, African countries will need to upgrade their human capital, in particular entrepreneurial, technical, or sector-specific skills to increase the availability of quality personnel for the industrial sector.

**Improving the business environment**

The business environment has improved considerably in recent years. According to the 2016 “Doing Business” report, five African countries (Uganda, Kenya, Mauritania, Benin, and Senegal) were among the top 10 economies that have most improved their business climates. In addition, Sub-Saharan Africa made 30% of regulatory reforms facilitating the business climate in 2014/2015. These reforms strengthened legal institutions and reduced the complexity and costs...
of the regulatory process. For example, the time needed to start a business came down from 63 days in 2005 to 27 days in 2016, and the cost of business start-up procedures, from 198% of per capita gross national income to 54%.

Figure 11. Cost of Starting a Business in the World

Despite the progress, there is much more to do in regulation, financing, fighting corruption, and securing investments. The business environment can be improved by establishing a single contact point between government and existing or new manufacturing firms. But to monitor the manufacturing sector’s development and evaluate the impact of support programs, quality data on the manufacturing sector will be required but is currently missing in most African countries. This lack of data has been an obstacle to generating information, knowledge, and data-informed policies on industrial development in Africa (see appendix 1).

A temporary solution can be to create special economic zones (SEZs), geographically located areas inside a country that typically aim to attract foreign direct investment (FDI) or promote exports in targeted manufacturing activities. Firms in SEZs usually benefit from tax breaks, subsidies, or higher quality infrastructure, creating a superior business environment (“pockets of efficiency”) than what exists in a country. SEZs promoted industrialization in East Asia, but most African countries are relative latecomers in the use of SEZs as a policy instrument, with only a few programs launched in the 1970s (Liberia in 1970, Mauritius in 1971, and Senegal in 1974) and the majority (80%) in the 1990s and 2000s (Farole 2011).

**Financing industrial development**

Access to affordable credit is one of the most binding constraints to (manufacturing) SMEs in Africa, mainly due to information asymmetries for project profitability and the lack of collateral or credit history. In addition, long-term financing, so critical for manufacturing firms, is hardly available, with the bulk of financing going to activities with quick turnovers such as trading. Well-functioning financial markets are therefore needed to provide grants or competitive loans to meet the various needs of manufacturing firms: for working capital, hiring production consultancy services, leasing or buying capital goods, acquiring or developing real estate, and so on. In addition, large investments requiring long-term financing will have to be made in the
infrastructures (such as energy, transport, or ICT) in order to lower transaction costs and build a competitive environment for manufacturing firms to thrive.

The erosion and volatility of external sources of revenues (natural resources or foreign aid) reveal the need to strengthen internal resource mobilization in Africa. With 15.4% of GDP in 2015, compared with 31.9% in other emerging and developing countries (IMF 2015), Africa has the world’s lowest saving rate. But Africa does have the potential to finance its own development (NEPAD & UNECA 2014).

Indeed, Africa collects more than US$520 billion a year in domestic taxes. And in 2015 the average tax to GDP ratio was about 20%, compared with 34% in OECD countries, suggesting that a lot of room remains for improvement. The continent also loses about US$60 billion annually in illicit financial flows through trade under-invoicing, transfer pricing by multinational companies, and corruption. African countries thus need to keep building stronger public financial management systems in order to expand the tax base, strengthen accountability, and increase public expenditure efficiency, while curbing capital flight.

Remittances also present a source of capital that can spur investment and growth. Official remittances to Africa, US$62 billion in 2014, have been growing tremendously from US$11 billion in 2000. But they can be expected to slow due to weak economic growth in Europe, lower oil prices in the Middle East, the depreciation of the euro, and the tightening of migration controls in many remittance-source countries. Yet, diaspora resources (through diaspora bonds and remittance-backed bonds) represent a largely untapped source of financing for industrial or infrastructure projects. According to the African Development Bank, Africa could raise US$17 billion a year by using future remittances as collateral.

Although still dominated by banks, capital markets are developing and beginning to do more in Africa’s financial markets, increasing long-term financing for industrial and infrastructure development. There are now about 25 stocks exchanges on the continent, with the Johannesburg Stock Exchange the most developed. In 2013 the total capitalization of Africa’s stock markets was around US$1.5 trillion. Bond markets in Africa are also in their infancy, driven mainly by government-issued securities with activity focused on the domestic primary market. Côte d'Ivoire’s sovereign bond issue in 2015 was followed by Gabon, Zambia, Ghana, Angola, and Cameroon. The six countries issued bonds worth US$6 billion by the end of 2015 (AfDB/OECD/UNDP 2016). The sovereign bond issues could provide low-cost financing for manufacturing and processing firms.

Private equity funds, venture capital, angel investments, mezzanine finance, and other private financial solutions are critical for innovative start-ups that are unfit for standard bank loans. Equity funds can overcome these failures through equity finance, which allows monitoring and controlling entrepreneurs’ actions. For instance, to add value to their portfolio companies, venture capital firms often provide management assistance, strategic involvement, or marketing assistance. Private equity funds can finance innovation and bridge financiers, entrepreneurs, scientists, suppliers, and customers, a function at the core of high-tech development (Florida and Kenney 1988a, 1988b; Saxenian 1998). Although still marginal in Africa, equity funds are growing, having reached US$22.7 billion in 2016.

Financing industrialization in Africa could also tap into African pension funds, African sovereign wealth funds, and mechanisms to use a portion of central bank reserves, currently kept in low-interest-bearing government paper overseas. Some 19 countries in Africa (such as Libya, Botswana, Chad, Rwanda, and Tanzania) have sovereign wealth funds (SWFs) with an asset base of more than US$159 billion in 2014 (6.4% of Africa’s GDP), and they are expected to grow as more countries prepare to set up their own SWFs (Hove 2016). The varied objectives of SWFs in Africa include economic stabilization, intergenerational savings, and domestic investments mainly in infrastructure.
The Bright Africa 2015 report by consultancy firm RisCura estimates pension fund assets in 16 major countries at US$340 billion in 2014, 90% of them in Nigeria, South Africa, Namibia, and Botswana. The pension funds can be leveraged to invest in longer-term projects, including industrial projects. While the above sections discussed internal resource mobilization, considerable amounts of resources are also available at the international level, looking for profitable investment opportunities. The African Development Bank intends to be a catalyst leveraging Africa’s own resources as well as international ones to promote structural transformation on the continent (box 2).

**Box 2. The African Development Bank’s “Industrialize Africa” strategy**

The Bank’s ambition is to help double the industrial GDP by 2025. Over the next 10 years, the Bank will invest US$3.5 billion a year through direct financing and leveraging toward implementing its six flagship industrialization programs:

1. **Fostering successful industrial policies.** The Bank will achieve this through program and budget support and technical assistance to governments to design industrial policies and to establish PPP units that will coordinate internal organizational entities to develop, implement, and monitor PPP deals successfully.

2. **Catalyzing funding in infrastructure and industry projects.** The Bank will increase its investment to the tune of US$2.5 to US$4 billion a year, including the Bank’s own investments. It expects to mobilize additional funds and crowd in around 1.5 times in a business as usual scenario.

3. **Supporting the growth of liquid and effective capital markets** in the continent. Over the next decade, the Bank will support 20 capital markets across Africa and set up the African Domestic Bond Fund with a target size of US$250 million.

4. **Promoting enterprise development** by contributing to an effective support structure for enterprise entry and expansion, with particular focus on SMEs. The Bank will increase its lines of credit to SMEs to reach US$800 million annually over the next decade. In addition, it will provide technical assistance to SME-focused entities (including incubation platforms potentially driven by UNIDO and financial institutions).

5. **Promoting strategic partnerships** by setting up a connectivity platform to share information as an honest broker. The Bank will host an Africa Investment Forum every two years to connect Africa-based enterprises with investors.

6. **Developing efficient industry clusters** by simultaneously supporting up to five industry clusters. Each of the five African regions will have one to begin with, but eventually expand to 35 industry clusters.

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6. **Bold and innovative policies are required for successful transformation**

Few countries have achieved sustained economic growth without industrializing (UNIDO 2009). And no country has industrialized without industrial policies, broadly defined as any attempt to shift resource allocation from what free markets would bring about (Noman and Stiglitz 2016). According to Warwick (2013), industrial policy can be defined as “any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity toward sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of such intervention, i.e. in the market equilibrium.” Thus defined, industrial policy would, in addition to industry, target other sectors that are key to industrialization, such as agriculture, finance, or transport. It is now clear that today’s industrialized countries have used industrial policies to support their industries (Chang 2002). European countries shifted toward privatization, deregulation, and competition only at the end of the 1970s (Ulltveit-Moe 2008). And they promoted free trade when their economies were competitive enough to benefit from opening to foreign competition (Weiss 2011).
Several African countries have set the objective to transform themselves into emerging countries within two decades or less, a very ambitious and daunting challenge, but not insurmountable. However, becoming emerging economies would require strong political willingness to make the necessary investments and changes, and obtain the buy-in of citizens to take up the challenge of rapid and sustained industrialization. Another requirement for these countries will be to endow themselves with an ambitious and long-term economic transformation plan that provides a clear vision and rationale for industrial development. And they have to harvest and organize the best of their talents, skills, and energies to meet the industrial development challenge.

**Behavioral transformation**

Empirical evidence shows that leaders matter for economic growth and that the effects of individual leaders are strongest where there are fewer constraints on a leader’s power (Jones and Olken 2015). For example, General Park Chung-hee is credited with playing a key role in South Korea’s economic transformation, as did Deng Xiaoping in China and Lee Kuan Yew in Singapore. More recently, in Africa, Ethiopia and Rwanda have been praised for the role of their leadership in transforming the natural-resource poor but fast-growing economies. The previous evidence indicates the need for increased focus on leadership selection in Africa so that leaders come with clear vision and ambition, in particular strong personal commitment to pursue economic transformation for sustainable growth and shared prosperity.

For sustainability, strong political leadership should be combined with a national change of mindset, with the aim to raise aspirations and ambitions and reinforce positive values throughout the country. Such a mindset change—or behavioral transformation—was critical to sustain economic development in Japan and South Korea. The Kaizen movement, launched in the 1950s in Japan through the combined efforts of private firms and public policies, turned these “lazy, short-sighted, and hardly productive” Japanese workers into hardworking and productive workers (Ohno and Ohno 2012). The Saemaul Movement launched in the late 1960s is considered the driving force for Korea’s social and economic development. By producing hardworking, motivated, and skilled human resources, this movement laid the foundation for Korea’s industrial development.

In the 1980s, Singapore launched a national quality and productivity improvement with Japanese assistance, the Productivity Movement. Extensive communication created a great sense of ownership and shared goals in the population, to the extent that even taxi drivers talked about productivity (Ohno and Kitaw 2011). Kaizen has also been introduced in several African countries such as Botswana, Burkina Faso, and Zambia. Ethiopia experimented with the Kaizen philosophy starting in 2012. The implementation of Kaizen has led to significant quality and productivity improvements in several sectors such as sugar and cement, while showing promising results in the construction and human resource development. The Kaizen approach is now embedded in Ethiopia’s second Growth and Transformation Plan (2015/2016–2019/2020).

Rwanda’s ICT drive can also be classified among national movements for mindset changes.

Another important medium for national mindset change is the education and training in Malaysia’s human development strategy that aims to use the educational and training system to inculcate and reinforce positive values such as “good work ethics, diligence, integrity, tolerance, gratitude, respect for authority, punctuality and pursuit of excellence are characteristics of a high-quality workforce.”12 Such positive values are necessary for building society and raising living standards. But reinforcing positive values at a young age can work only when adults display these values in their behavior.

**Designing an industrial development strategy**

The success of most industrial policies rested on carefully designed development strategies that were implemented in waves over long periods of time. For example, South Korea started by creating the Economic Planning Board (EPB) in 1961, and by launching the first economic
development plan (1962–1966) in 1962. This was followed by successive five-year development plans until 1996. The government combined import-substitution and export-oriented strategies by building basic industries (such as cement or fertilizer), light labor-intensive manufacturing (textiles, footwear, wigs) and infrastructure such as communication, energy, and transport (Chung et al. 1997). In Malaysia the First Plan was implemented over 1966–1970, followed by the Second Plan (1971–1975), which implemented the New Economic Policy (NEP) to reduce social inequality and poverty through economic transformation. In 1991 the NEP was replaced by the National Development Policy but with similar objectives; and in 2016 the Malaysian government released its 11th economic development plan for 2016–2020, to make Malaysia a high-income economy by 2020.

In Africa, for about three decades from the early 1960s, economic planning was the guiding principle in formulating government policy for many African countries. By 1963, 25 of the 32 independent African countries had centralized development plans of one form or another while the rest were initiating their own (Gedamu 1963). At the turn of the 1970s virtually every African country had a development plan. Yet, in the 1980s most African countries abandoned development planning following the adoption of Structural Adjustment Programmes (SAPs), as a precondition to access credit facilities from the Bretton Woods institutions. The new order was to privatize, liberalize trade, and increase reliance on foreign and private sector investments to stimulate economic growth. In many African countries, SAPs failed to deliver the expected economic growth and social development, renewing interest in development planning and high-quality economic transformation plans. At least 26 African countries currently have a national strategy for industrial development, though effectiveness in implementation varies greatly (AfDB/OECD/UNDP, forthcoming).

Lin (2009, 2010) provides an analytical framework for the approach taken by most countries to achieve economic transformation through industrialization. Most successful countries started by learning from successful predecessors and adapting lessons to local circumstances. For example, European countries such as Belgium, Switzerland, and France followed Great Britain’s footsteps (Smirzai 2012). Belgium faithfully copied the English industrialization pattern based on coal mining, engineering, and textiles. Switzerland, as a small resource-poor and land-locked country, focused on technologically advanced products such as fine silks and watch-making. France concentrated on high-quality and luxury goods, taking advantage of its artisanal and artistic skills. More recently, Korea, Taiwan-China, and Singapore imitated Japan in the 1960s and 1970s. Mauritius emulated Hong Kong-China in its catch-up strategy in the 1970s. China did the same as Korea, Taiwan-China, and Hong Kong-China in the 1980s (Lin 2011).

Catching-up is progressive in the sense that countries climb up the technology ladder gradually, as suggested by Lin (2011), following a “flying geese–leading dragons” pattern. The “flying geese” describes how latecomer economies can catch up following a three-dimensional sequential process: the intra-industry dimension, the interindustry dimension, and the international division of labor dimension. The first dimension (intra-industry) relates to the product cycle, where a country initially imports a good, then produces it while still importing, and finally moves to exports. The second dimension (inter-industry) involves the birth and development of increasingly diversified industries that upgrade from simple (textiles) to more sophisticated (steel or electronics) products. The third dimension relates to the relocation of industries across countries, specifically from advanced to developing countries to decrease production costs.

A practical framework for implementing the “flying geese” approach is provided by Lin and Monga (2011) in a six-step Growth Identification and Facilitation framework, with a view to help countries identify and facilitate individual paths to sustainable economic transformation. In addition to this strategic approach to economic transformation, building consensus and support
for a shared development agenda should be captured in an output document (strategy document). There are four broad types of industrial strategy document:

- Overall industrial master plans cover multiple industrial activities, organized by issues (technology, human resources) or including sector-specific chapters (electronics, machinery, food processing). Box 3 gives potential issues that can be discussed.
- Sector-specific master plans aim to develop one specific industry, such as textiles, food processing, or electronics.
- Issue-specific master plans target cross-cutting issues of industrial development such as energy transport and logistics, small and medium enterprises, and education and training.
- Regional development master plans are strategies for the industrial development of particular regions or economic zones.
Box 3. Basic framework of an industrial strategy blueprint

For each master plan, stakeholders, particularly the private sector, should discuss and set priority issues to be tackled over the lifespan of the strategy document, depending on capacity and available resources. Possible issues to consider are:

**Cost issues**
- Raw materials and inputs procurement → **Linkage with primary sector**
- Manpower development and training for industrial development
- Financing for industrial development (ODA and external borrowing)
- Land and infrastructure (transport, energy, water, telecommunications)
- Marketing and distribution of industrial products → **Internal and external trade**
- Legal and regulatory environment (business registration and licensing)
- Industrial associations and relations

**Quality issues**
- Standards for industrial development (ISO, quality, environment, accounting)
- Certification, award, and labeling
- Testing and metrology

**Technology issues**
- Skills and technology
- Innovation, R&D for industry (product design and development)
- ICT for industrial development
- Intellectual property rights for industrial development

**Other issues**
- SME support
- Occupational health and safety
- Environmental sustainability
- Gender and youth in industry
- Industrial data and information → **Industrial statistics**
- Spatial distribution of industrial development
- Strategic interventions in industrial development → **Picking winners**

**Coordination and implementation**
- Coordination (inter-ministerial)
- Public-private partnership
- Budget allocation

Some practical advice:
- First, sectoral master plans for priority industries should be drafted one by one over several years.
- Second, the total number of industrial master plans should not exceed 10 when the drafting cycle of five years is completed.
- Third, the document size should not be too large, about 50–100 pages.


For each issue, a basic structure for the chapters in an industrial strategy blue-print is proposed in box 4.
Based on the East Asian experience, Weiss (2011) summarizes several principles that foster success in industrial policies:

- A regular dialogue with the private sector to identify problems, provided that governments avoid capture by producer interests.
- Clear performance criteria for establishing success or failure, combined with transparency regarding who receives government support.
- Time-limited support, so recipients have an incentive to improve efficiency by the end of the period specified.
• Support should be for activities (such as R&D or labor training) or sectors (like electronics) rather than to individual firms to avoid distorting competition and establishing monopolies.
• Exporting should be encouraged as a means of introducing competition and opening a sector to foreign technology.

**Building government policymaking capability**

Noman and Stiglitz (2016) consider long-term economic development to rest on “learning” (in policymaking, technology, business, economic management, international relations), a dynamic process at the heart of development. Institutional learning and strengthening are cross-cutting factors for successful policymaking. No country in the world has been able to make and implement policy without influential and capable organizations staffed with qualified and committed civil servants.

The Asian experience is illustrative of the dynamic capacity development that can take place in policymaking (Ohno and Ohno 2012). Early in the 20th century, Japanese workers were, as mentioned earlier, described as “lazy, unskilled, and only half as productive as American workers.” Likewise, until 1960, South Korean officials were seen as “inept and corrupt,” and the country had “no prospect for profitable investment in comparison with the resource-rich North” (World Bank 1993; Kim and Leipziger 1993). Today, both countries have industrialized and are exporting the policymaking practices. The East Asian experience also suggests that the capabilities that good policymakers need are not necessarily the knowledge of supposedly relevant subjects, like economics, but general intelligence and the ability to learn, manage complex projects, and maintain organizational coherence (UNECA 2016).

Unfortunately, the low capability of developing countries in designing and implementing industrial policy is sometimes emphasized to explain why these countries should not implement industrial policies. But strong policy capabilities should not be considered a precondition for policy design and implementation, since they take time and practice to build, with numerous trials and errors (box 5). And for capacity development, African governments should avoid outsourcing policy drafting (and often implementation) as much as possible and learn how to build consensus by involving various stakeholders (in particular, the private sector) in the policy process; particularly when the aim is to develop nationally shared development vision and goals. Such consensus building was instrumental in developing and implementing successful policies in Mauritius. For example, the Joint Economic Council, an umbrella association of sector-specific groupings, has fostered public-private sector dialogue, ensured that members’ ideas are regularly conveyed to political leaders (including the prime minister), and provided input on major policy decisions (Zafar 2011).
Box 5. Illustrative policy learning: Israel's venture capital industry

The Government of Israel provided massive support for R&D and to innovative start-ups, starting in 1969. But insufficient sources for follow-up financing, weak management capabilities, and non-market-focused technological development were blocking the successful creation and maturation of start-ups according to government analysis. As a result, the government gradually shifted policy objectives from R&D promotion to the enhancement of start-up formation, survival, and growth.

In the early 1990s, a large number of new government programs were launched including the moderately successful Technology Incubator Program which supported new entrepreneurs for a period of three years during the seed phase in privately-owned incubators; and the Magnet Program, which was a US$60M (per year) horizontal program supporting cooperative, generic R&D involving two or more firms and at least one university. In a continued search for more effectiveness in government support programs, a diagnosis by the Ministry of Industry and Trade concluded that the weak links in the system were both financial and marketing-related and that the establishment of a VC industry could remedy this deficiency. This led to the Inbal Program (1991).

Inbal was a government-owned insurance company, which gave partial guarantees to investors in local venture capital funds. Four venture capital companies were established under Inbal regulations. However, neither the funds nor the Inbal program were successful, suffering for example from onerous bureaucratic oversight procedures or the necessity of submitting time-consuming periodic reports. While the program failed to spur venture capital industry emergence, the lessons learned from this first attempt contributed to the design and implementation of Yozma (1993–1998).

Yozma was a US$100 million government-owned VC fund with two functions: the first operated as a fund of funds investing US$80 million in 10 private Israeli VC funds, US$8 million in each fund. Receiving this US$8 million was conditional on matching with US$12 million in private funds in addition to attracting a reputable foreign VC fund or foreign financial institution to also invest. Finally, the government retained US$20 million to create the government-owned Yozma Venture Fund. The fact that, through Yozma, the Government of Israel was willing to invest directly and indirectly in start-ups was an important profitability confidence signal to investors (Erlich, 1998 and 2000).

The most salient aspect of the Yozma program was its emphasis on learning. The first dimension of this learning occurred through the interaction with the foreign investors. The second dimension was through the participation of the Yozma Venture Fund managers in the board meetings of all Yozma funds. Not only did they learn through participation, but also there is evidence that they stimulated co-investment. Further, personal links assured informal interaction between the fund managers.

The Yozma program was very successful. VC investment increased from US$5 million in 1990 to US$3.3 billion in 2000. The accumulated number of start-ups created was more than 2000; total capital raised by VCs was approximately US$10 billion, the total capital raised in capital markets reached about US$15 billion, and there was an additional US$20 billion in mergers and acquisitions. Yozma Funds also triggered industry growth in the form of much larger follow-on funds that received no support from the Yozma program.

Israel’s experience with venture capital could be relevant in other contexts particularly when success in the new industry to be targeted depends on a) generating a critical mass of resources, both financial and other, b) accessing sophisticated world class foreign agents and linking them with domestic ones, and c) triggering a sufficiently potent self-sustained process of industry “emergence.”


Types of industrial policy instruments

Government can intervene in support of industrial development: as a regulator that establishes tariffs, fiscal incentives, or subsidies, as a financier influencing the credit market and promoting the allocation of public and private financial resources to industrial projects, as a producer participating directly in economic activity through state-owned enterprises, and as a consumer that guarantees a market for strategic industries through public procurement programs (Perez and Primi 2009).
First, as a regulator, a government defines the business environment in which firms evolve, and this environment should be conducive to business. In addition to regulations and laws, fiscal incentives are one of the most common instruments to promote the manufacturing sector. They include both direct subsidies and indirect subsidies. Direct subsidies can promote industrial development through direct cost reductions, in areas such as production, investment, R&D, exports, or training. Indirect subsidies, specifically tax incentives, can also be used to favor manufacturing activities.

Tax holidays and tax rate reductions for specific types of activities or locations are common forms of tax incentives in developing countries (Easson and Zolt 2004), although care should be taken to avoid a race to the bottom. For example, Nigeria, Ghana, Thailand, and Malaysia all apply a tax holiday of between 3 and 10 years for pioneering enterprises, while South Korea offers reduced tax rates to SMEs in the first four years. The length of a tax holiday takes into account the characteristics of the targeted manufacturing sector, shorter for export-oriented textile or leather firms with expected quicker profits relative to other types of firms (Easson and Zolt 2004).

Second, as a financier, governments can put in place financial instruments to ease access to finance for manufacturing firms and increase their competitiveness. One such instrument is the partial guarantee to increase lender confidence in making investments in SMEs, by decreasing the default probability or increasing recovery if default occurs. Since the partial guarantee is a second best, it is important for countries to strengthen credit institutions by establishing credit bureaus and providing credit rating systems.

Development banks would aim at providing long-term financing to manufacturing firms in order to sustain industrial development while building modern infrastructures (in energy, telecommunications, and transportation). The Development Bank of Ethiopia, with history dating back to 1909, promotes the national development agenda through development finance and close technical support to viable projects. Its credit policy is purely aligned with government priority areas, which include commercial agriculture, agro-processing, manufacturing, and mining. In 2016, Nigeria announced the launch of the Development Bank of Nigeria to meet the funding needs of the micro, small, and medium enterprises.

Third, state ownership of enterprises can be justified when natural monopolies are unsuitable for private enterprises, for social or developmental goals, or for national economic security (Mattlin 2007). These enterprises can also be incubators for technical skills and managerial talent, as in China (Rodrik 2010). They can pioneer a sector’s development when the private sector is not strong enough to do so, and there are successful examples of state entrepreneurship. The Korea steel firm, POSCO, began production in 1973 when the country’s main exports were fish, cheap apparels, wigs, and plywood, and became the most efficient steel producer in the world within 10 years (Chang 2006). Similarly, Embraer, the state-owned Brazilian aircraft company, has become a key player in the aerospace industry. Both firms were subsequently privatized, having allowed their countries to become a global player in their sector of activity.

Fourth, as a consumer, the government can promote industrialization by using its purchasing power to stimulate economic activity, protect national industry against foreign competition, improve the competitiveness of certain industrial sectors, or remedy regional disparities (Watermeyer 2000). For instance, public procurement policies were used extensively in East Asia to develop or improve the competitiveness of priority sectors (Kattel and Lember 2010). As explained in UNIDO (2013), “These countries started by clearly identifying the products and the technological capabilities and know-how needed to produce them; procurement contracts were then awarded to domestic firms conditional on the government setting deadlines and quality standards to ensure continued improvement and productivity increases in the production of these targeted products.” Variants of public procurement exist. For example, countertrade agreements require a foreign firm to transfer economic benefits
(technology transfer, managerial services, licensed production, local content, or co-production) to the domestic economy as a condition for awarding a procurement contract, with a view to building or improving domestic productive capabilities. Note, however, that public procurements may violate the WTO principle of equal treatment, and trigger complaints from foreign firms (Yülek and Taylor 2012).

7. Conclusion

This report analyzed the manufacturing production and manufactured export performance in Africa. It finds that African countries are facing deindustrialization. In international trade, Africa continues to play a peripheral role, with the majority of exports being commodities or resource-based and low-technology manufactured products, coupled with high concentrations in exports markets and products. And African countries’ high reliance on the primary sector increases their vulnerability to external shocks, as illustrated by the recent commodity slump, which put an end a decade-long growth spell.

If African countries are to improve their development performance and promote industrial development, their governments cannot continue business as usual. Strong political leadership should be combined with a national movement for mindset change, to raise aspirations and ambitions and reinforce positive values throughout the country. Such leadership and mindset change will be critical in the pursuit of the Agenda 2063’s vision to have an “integrated, prosperous and peaceful Africa, driven by its own citizens and representing a dynamic force in the global arena.”

To build more resilient economies, broadening and deepening the manufacturing sector hold higher promise for long-term and sustainable growth. Given the continent’s agricultural, mining, and maritime resource endowments, a resource-based industrialization strategy could be pursued through the transformation, processing, and commercialization of agricultural products for intermediary or final consumption. Such Productive Capacity Development strategies will have to be carefully designed following principles such as regular dialogue with the private sector to identify problems, clear performance criteria for establishing success or failure, time-limited support for new activities, and export promotion to enhance competitiveness.

Industrial development will simultaneously require coordinated actions in various areas of the economy, including the establishment of forward and backward linkages, particularly with the agriculture and mining sectors. It will require investments for infrastructure development in energy production, transport, and ICT. It will require implementing reforms to improve the business environment and upgrade labor and entrepreneurship skills as well as production technology. And it will require improving market access within and outside the continents.

Appendix 1: Availability of Industrial Statistics (ISIC Revision 3 2-Digit Level)

The table shows the first and last year where data exist; but some years in between might be missing

<table>
<thead>
<tr>
<th>Country</th>
<th>Establishments</th>
<th>Employees</th>
<th>Wages and salaries</th>
<th>Output</th>
<th>Value added</th>
<th>Gross fixed capital formation</th>
<th>Female employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Start Year 1 / End Year 1</td>
<td>Start Year 2 / End Year 2</td>
<td>Start Year 3 / End Year 3</td>
<td>Start Year 4 / End Year 4</td>
<td>Start Year 5 / End Year 5</td>
<td>Start Year 6 / End Year 6</td>
<td>Start Year 7 / End Year 7</td>
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Source: UNIDO (INDSTAT 2, 2016).
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UNIDO (2016), Manufacturing Value Added (database).


World Bank (2016a), World Development Indicators (database).


1 See AfDB (2016a).
2 While the economic dimension is of prime importance, it is worth noting that most developing countries fall short in providing a range of institutions to facilitate the functioning of markets and businesses, leading to higher transaction costs and operating challenges (Khanna and Palepu 2013). “Emergence” should therefore go with significant improvements in the functioning of political, legal, and economic institutions.
3 See Monga (2012).
4 In 2015, North America (48.1%) and Europe (25.6%) were the largest world manufacturers, followed by Asia (18.0%) and Latin America (6.4%).
5 See also UNCTAD/UNIDO (2011).
6 The small range of the market diversification index can be explained by the limited number of markets in the world compared with the number of products.
7 IBP 2017.
8 To support greater accountability and transparency in the management of natural resources in Africa, the AfDB established the African Natural Resource Center, with the mandate of assisting member countries with policy advice, technical assistance, advocacy, and knowledge development on the area of natural resources. In addition, the African Legal Support Facility (ALSF) housed at the AfDB was established in 2010 to support African governments in negotiations of complex commercial transactions and dealing with transfer pricing and tax avoidance.
11 For details on industrialization, see AfDB (2016a).