

**CHAPTER 3**  
**TOWARDS A NEW  
INDUSTRIAL POLICY IN AFRICA:  
INDUSTRIAL DIAGNOSIS AND  
STRATEGY DESIGN**

## A. INTRODUCTION

The analysis of Africa's industrial performance in the previous chapters suggests that most countries in the region are still struggling to develop a competitive manufacturing sector. But there is at the same time a growing consensus that African countries have to diversify their production and export patterns to reduce vulnerability to shocks, to boost growth, to provide employment opportunities and to enhance their integration into the global economy. Against this background, there is an increasing interest amongst African policymakers in the potential role of industrial policy in the region. But at the same time they are searching for a new approach which does not repeat the mistakes of the past. The rest of this Report discusses key elements of new industrial policy in Africa.

There is no convergence of views on what should constitute industrial policy.<sup>7</sup> In this Report, the term is used to describe *government measures aimed at improving the competitiveness and capabilities of domestic firms and promoting structural transformation*. Industrial policy involves a combination of strategic or selective interventions aimed at propelling specific activities or sectors, functional interventions intended at improving the workings of markets, and horizontal interventions directed at promoting specific activities across sectors (Lall and Tuebal, 1998). An important aspect of a new industrial policy is that it should be part of a broader productive development strategy which is concerned with enhancing capital accumulation and knowledge accumulation. But the focus in this Report will be on developing the manufacturing sector.

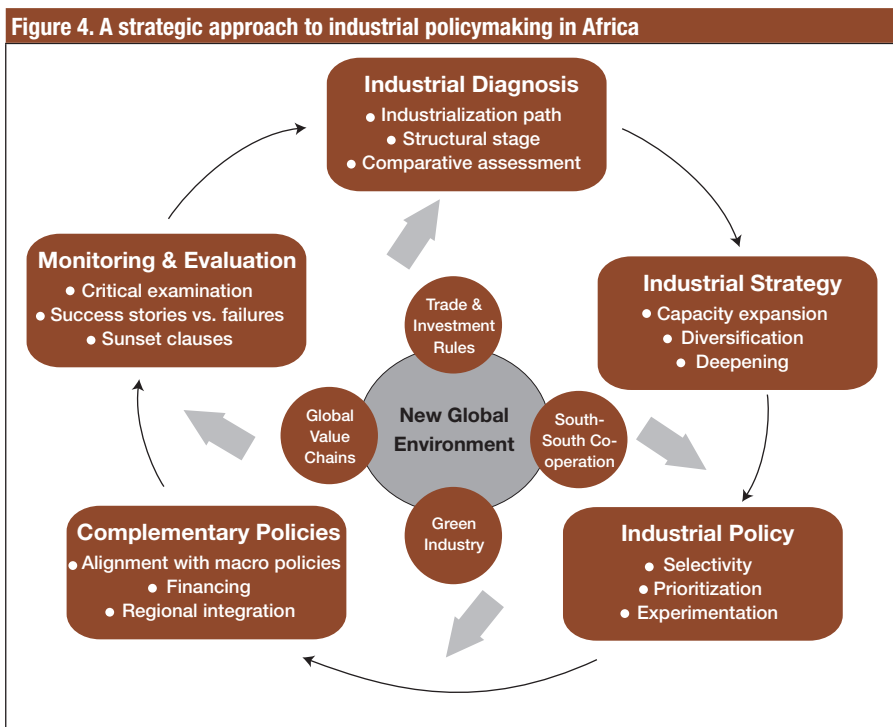
The present Report advocates a strategic approach to industrial policymaking which is tailored to specific country circumstances. A one-size-fits-all approach has not worked in the past and will simply not work in the future. Country specificities necessitate flexibility in the strategy design and also the policymaking process. A new industrial policy should not follow a universal blueprint approach. Instead, it has to build on the initial conditions and deliberately target the country specific economic constraints that are the key obstacles to a sustained industrial growth path.

Taking into account the importance of country specificities, an industrial strategy has to be designed on the basis of the country's current situation or starting position. Most importantly, the already existing manufacturing activities have to be taken into consideration as well as differing development stages, endowment structures, country and population size, etc. This implies that the design of an industrialization

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strategy has to be based on a thorough evaluation of the country's present industrial base, i.e. an industrial diagnosis.

Figure 4 summarizes this policymaking process. It starts with an industrial diagnosis and the design of an industrialization strategy, and then moves to consider the industrial policies needed to implement the strategy. The figure also indicates that industrial policies have to be aligned with other policy areas that should complement the decisions taken, in particular macro-economic policies and financial policies. Another important feature of this strategic approach to industrial policymaking relates to the feedback loop from policymaking to the diagnosis stage. Essentially, it has to be ensured that a critical examination of prior policy decisions (i.e. an independent monitoring and evaluation process) identifies success stories and failures that can inform the next policymaking cycle. Through such monitoring and evaluation, a systematic process of policy learning can take place, enabling



Source: UNCTAD/UNIDO.

adaptation and better performance. On top of that, the decision-making process needs to take serious account of the challenges and opportunities of the new global environment.

The rest of this chapter focuses on the first two stages of the strategic approach to industrial policymaking – industrial diagnosis and industrial strategy. This is concerned specifically with the strategic or selective dimension of industrial policy. Chapter 4 considers the why and how of industrial policy, including monitoring and evaluation, and also the importance of complementary policies. Chapter 5 discusses the new global environment and considers how the strategy and policy might take into account new trade and investment rules, climate change challenge, South–South cooperation and the potential of integrating into global value chains.

## **B. THE QUESTION OF STRATEGIC CHOICE AND SELECTIVITY IN FACILITATING STRUCTURAL CHANGE**

Following Lall (1996) and Lall and Teubal (1998), industrial policy can take three forms: functional, vertical and horizontal. Functional policy refers to government interventions aimed at improving the operation of markets, in particular factor markets, without favouring activities. Examples would be interventions to prevent collusion and facilitate entry by entrepreneurs into markets, or measures to reduce the transaction costs of doing business. Vertical policy, on the other hand, refers to interventions that favour specific sectors, industries or firms. Examples are sector-specific subsidies and giving certain firms or sectors preferential access to capital. In contrast with vertical policy, horizontal policy is geared towards promoting specific activities across sectors. For example, the provision of support for research and development or finance for innovative activities is a horizontal policy.

Efficient industrial policies normally include some mix of functional, horizontal and vertical elements. However, if African governments want to steer productive activities in a particular direction, they must decide on a specific way forward. Selectivity of course raises difficult issues which are often summarized with the advice that governments are wrong to “pick winners”. But African countries face serious technical, capacity and time constraints. Thus, it is impossible for them to tackle all economic constraints in all industries simultaneously. Also, whilst financial capital is quite fungible, much fixed physical capital and human capital is often specific to certain products and sectors. One cannot grow pineapples on cocoa trees. Moreover, while the upgrading of the food industry will definitely

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require advanced capabilities in food processing, testing, etc., that only agricultural engineers possess, a diversification into electrical machinery will most probably be impossible without a critical number of electrical engineers. It is therefore necessary to make strategic choices and to prioritize the identified needs for action. How that is done is then the critical issue.

One approach which has been proposed by Lin and Monga (2010: 17–19) involves six steps:

- First, the government identifies the list of tradable goods and services that have been produced for about 20 years in dynamically growing countries with similar endowment structures and a per capita income that is about 100 per cent higher than their own;
- Second, among the industries in that list, the government may give priority to those in which some domestic private firms have already entered spontaneously and try to identify (a) the obstacles that are preventing these firms from upgrading the quality of their products; or (b) the barrier that limit entry to those industries by other private firms;
- Third, for those industries which are completely new to domestic firms, the government could adopt specific measures to encourage FDI from higher-income countries and incubation programmes to catalyse private domestic firms into these industries;
- Fourth, support should also be given to industries not on this list but which are successful self-discoveries by private enterprises in the country to enable the scale up of these industries;
- Fifth, in countries with very weak infrastructure, and an unfriendly business environment, the government should invest in industrial parks or export processing zones and attempt to attract domestic firms and foreign firms that are willing to invest in the targeted industries;
- Sixth, the government can provide time- and cost-limited incentives to pioneer firms or foreign investors that work within the industries identified in step 1 to compensate for non-rival public knowledge created by their investments.

Whilst this approach is quite sophisticated in many respects, it focuses particularly on identifying the most promising activities that match a country's

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current comparative advantage. Whilst this is certainly an important aspect of industrial policy, successful industrial policies have often involved a combination of “leading the market” and “following the market”. In the former case, government encourages investment decisions that private actors would not make, whilst in the latter, the government supports some of the investments and innovation of private firms to encourage a marginal extension of the production frontier in specific areas of production. Leading the market seeks to anticipate the future, in which existing comparative advantages in natural resource based and cheap labour are used up, and also seeks to create comparative advantages in particular products and sectors by building technological capabilities at the firm level and clusters of activity. In such cases, the government not only exploits current comparative advantage but also, in certain sectors, seeks to “defy” current comparative advantage at a particular moment in time in order to ensure that gradually, over time, its comparative advantage is extended and upgraded (see debate between Lin and Chang, 2009).

What this implies in practice is, as Lauridsen (2010) points out, the nurturing of a new generation of industries. This can be done in various ways, including in particular (a) fostering new industrial capacity, (b) diversifying production, (c) creating inter-sectoral and inter-industry linkages, (d) promoting learning, (e) improving productivity, (f) shifting economic activity towards higher value added activities that provide access to more dynamic and rewarding niches in the world. Although it is not easy to draw the exact boundaries between these dimensions in reality, Lauridsen broadly distinguishes three complementing and interlinked strategic approaches:

- *Industrial diversification* implies the creation of new industrial capacity through the nurturing of hitherto non-existent manufacturing activities, thus leading to sectoral diversification;
- *Industrial deepening* aims at the creation of more backward- and forward-linkages and complementarities within a country between sectors and industries;
- *Industrial upgrading* aims at fostering a more advanced and competitive industrial structure through product upgrading, process upgrading and functional upgrading.

In other words, when designing industrial strategies, governments have to decide which existing manufacturing industries they want to strengthen, which new

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industries they want to stimulate and in which industries they want to improve the internal integration of existing involvements.

As indicated earlier, this cannot be done according to a recipe. But Africa can learn from the experiences of earlier industrialization success stories, at least to some extent. One promising way to use this historical knowledge relates to the anticipation of the structural change process (Altenburg, 2011). Although Africa's future will obviously not resemble the industrial development path of other regions, earlier successful industrial growth trajectories can certainly provide reference points. A comparative analysis with suitable comparators can thus shed light on options for proactive measures to shape Africa's industrialization.

### C. A FRAMEWORK FOR INDUSTRIAL STRATEGY DESIGN

Figure 5 provides a framework for identifying industrial development priorities, which takes account of the potential of current comparative advantage and also activities that can become viable in the medium and long run. The framework is based on two dimensions. Firstly, it has to be acknowledged that the relative potentials that different industries offer to a certain country depend on their *feasibility*, namely the requirements that these industries have with regard to technological capabilities and endowment structures. Secondly, the decision on which industries to support should be based on a detailed understanding of the relative *attractiveness* of individual manufacturing sectors for the country in question, at its current and future stages of development.

The attractiveness of industries can be evaluated in several dimensions. The growth dimension of attractiveness looks at the economic growth potentials that certain sectors offer to countries that are at a certain development stage and have certain endowment structures as well as technological capabilities.<sup>8</sup> In addition, global market factors such as market size, market growth and the intensity of competition also influence this dimension. For example, the fact that China is extremely dominant in the world market for several products today certainly reduces the attractiveness of these activities for African countries. However, industrial policies for African low-income countries should always balance economic with social and environmental goals and thus need to comprise a social and environmental impact assessment (Altenburg *et al.*, 2008).

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In order to ensure a poverty reduction focus, the attractiveness evaluation should include a pro-poor dimension. With the aim of ensuring equal opportunities for the African poor to participate in manufacturing, the employment effect of individual sectors as well as growth inclusiveness aspects have to be factored in. In this respect, it is important to highlight the finding that resource-based industrialization usually goes hand in hand with a more unequal growth path than labour-intensive manufacturing (UNIDO, 2009). As far as the environmental dimension is concerned, the ecological impact of individual industries has to be considered because environmental concerns and especially climate change will increasingly affect the industrialization path of African countries in the near future. One promising way to take the environmental implications of structural change into consideration is to compare the energy efficiency (UNIDO, 2011), material efficiency as well as resource depletion effects of the relevant sectors. In sum, it has to be acknowledged that industrial strategies will always face the trade-off between economic, social and environmental targets. Although a detailed comparative analysis of the attractiveness of industries in the three dimensions can certainly inform policy decisions, the ultimate necessity to execute a judgement will never disappear.

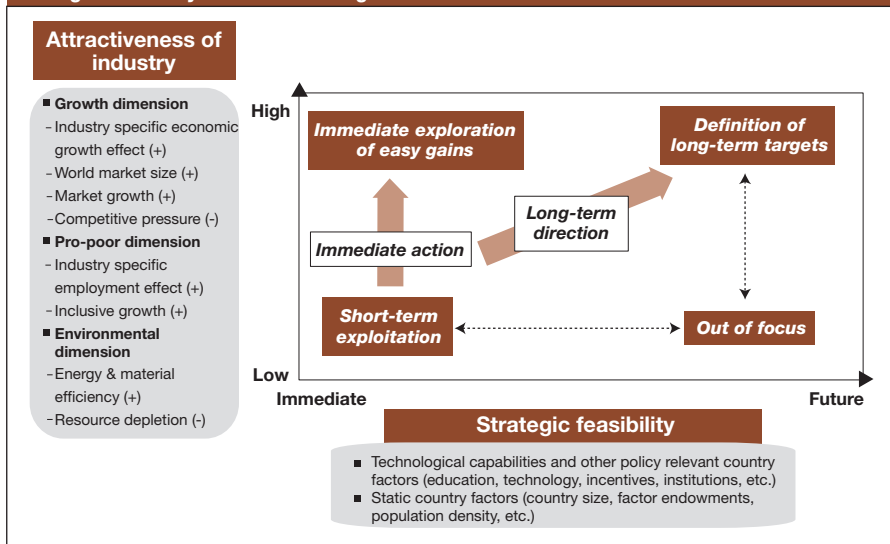
Apart from the attractiveness assessment, industrial strategies have to take the strategic feasibility of manufacturing activities into consideration. While some activities are immediately viable because they are in line with the country's current endowments, capabilities, etc., other activities will only be feasible in the future, e.g. because they require a substantial enhancement of the technological capabilities. Some opportunities within current comparative advantage might also not be fully utilized. A major error which countries can make in formulating industrial policies is that they rush to promote sophisticated industries without the requisite accumulation of skills and scale economies. While Lin & Monga (2010) do not consider potentials in industries that are not in line with a country's current comparative advantage in their identification framework, this approach provides additional insights into activities that might require "defying" the current comparative advantage in order to build the necessary technological capabilities for activities that will be viable in the medium to long-run (Lin & Chang, 2009).

On the basis of this framework, it is possible to compare the relative attractiveness and strategic feasibility of various manufacturing industries for a specific country case. In addition, it is also necessary to get an idea of the scale of the output potentials that these industries have for the respective country.

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**Figure 5. Framework for the comparative assessment of the relative attractiveness and strategic feasibility of manufacturing activities for African countries**



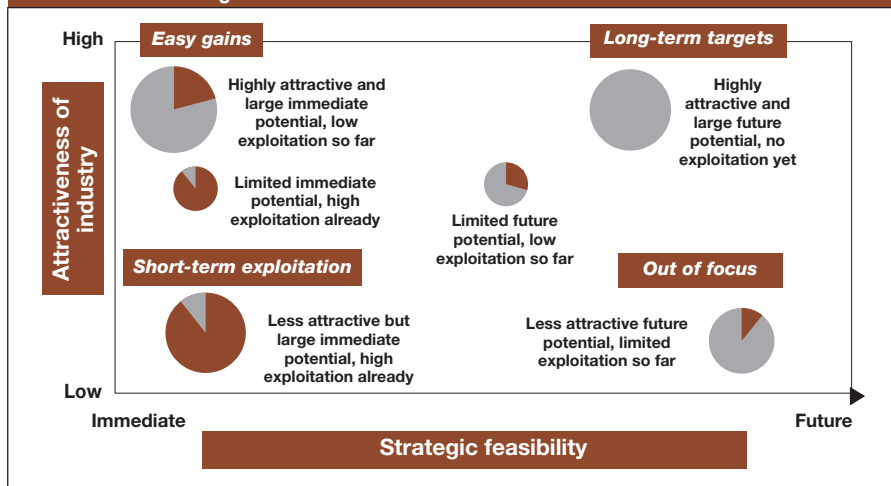
Source: UNCTAD/UNIDO.

Figure 6 illustrates the current as well as future potentials in individual manufacturing industries for a hypothetical country. A large bubble represents a relatively high immediate or future output potential, while a small bubble represents an industry in which the output potential is rather limited. On top of that, the brown share of the bubbles indicates the potential that is already being exploited, while the grey share indicates the potential that is not being exploited yet.<sup>9</sup> Generally, the following assertions can be made with regard to potentials at the four combinations of high and low industry attractiveness as well as immediate and future strategic feasibility that can be distinguished:

1. Industries that have an immediate strategic feasibility but a relatively low attractiveness, e.g. because of their limited growth potential. In these sectors, the short-term exploitation of currently unused potentials should be the focus. If there are still large potentials that are not being exploited at the moment, capacity expansion measures play a major role here. If the exploitation ratio is already very high, process and product upgrading as well as deepening measures could be considered. However, given their low attractiveness, these activities have a low priority in African industrialization strategies;

2. Industries that have an immediate strategic feasibility and a high attractiveness, e.g. because of their rapid growth prospects. If countries are underrepresented in these sectors, i.e. they have a *latent* comparative advantage (Lin & Monga, 2010), immediate action is required to take advantage of the potential. When the country already covers these activities to a certain extent, capacity expansion and upgrading as well as deepening measures are highly relevant. If these sectors are not existing yet, short-term diversification measures towards these industries could be considered. Essentially, governments have to remove the constraints that impede the expansion of the identified industries to create the conditions that allow them to become the country's actual comparative advantage.<sup>10</sup> Given their high attractiveness, African governments should give a high priority to these activities in their industrialization strategies;
  3. Activities with high attractiveness but which are only feasible in the future, e.g. because they require advanced technological skills. Although the country does not have a current (*latent/static*) comparative advantage in these sectors, African countries cannot afford to disregard the future potentials that these industries can offer. Instead, they should carefully select the most promising industries as long-term targets and deliberately invest in developing the lacking technological capabilities that are crucial to succeed in these sectors in the future. Long-term diversification measures are obviously essential in this respect. Deepening measures can also be considered at a certain stage – e.g. the creation of clusters to foster linkages between the new entrepreneurs and already existing relevant domestic suppliers of key inputs. Several authors argue that government intervention should exclusively focus on sectors with latent comparative advantage. This more dynamic approach to the design of industrialization strategies will also give a high priority to the definition of long term targets instead;
  4. Industries which are only feasible in the future and have a low relative attractiveness, e.g. because they do not have major growth prospects. These industries are obviously no priority for African industrialization strategies. However, the distinction between these sectors and the long-term target sectors is perhaps the most crucial exercise for the long-term direction of an industrialization strategy.
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Figure 6. Illustration of the relative attractiveness and feasibility of unused potentials in various manufacturing industries



Source: UNCTAD/UNIDO.

## D. APPLYING THE FRAMEWORK: A TYPOLOGY OF AFRICAN COUNTRIES' INDUSTRIAL PERFORMANCE

In order to discuss and assess future industrialization possibilities and opportunities, country-specific details have to be taken into account. In practice, this must be done on a country-by-country basis. However, recognizing the heterogeneity of African countries, this section presents a typology of industrial performance of African countries which might be used at an initial stage to consider possible strategic options for different countries.

The typology is based on two indicators: their industrialization level in 2010 and industrial growth performance 1990-2010:<sup>11</sup>

- The *industrialization level* of each country is captured by its manufacturing value added per capita. This indicator allows us to identify African countries which have a substantially higher manufacturing capacity than the regional average as well as those that do not possess any sizeable manufacturing activities yet. Since the regional average MVA per capita is \$100, African countries that have an MVA per capita level of \$200 and above are considered

to have a relatively advanced industrialization level. It should be noted that the threshold level used is twice the regional average;

- The *industrial growth performance* is captured by the compound annual growth rate of MVA per capita. This indicator allows us to identify the most dynamic African industrializers as well as stagnating and de-industrializing countries. Countries that have an MVA per capita growth rate higher than 2.5 per cent are regarded as having relatively very high growth performance. The 2.5 per cent threshold is about 3.5 times the African average MVA per capita growth of 0.7 per cent.

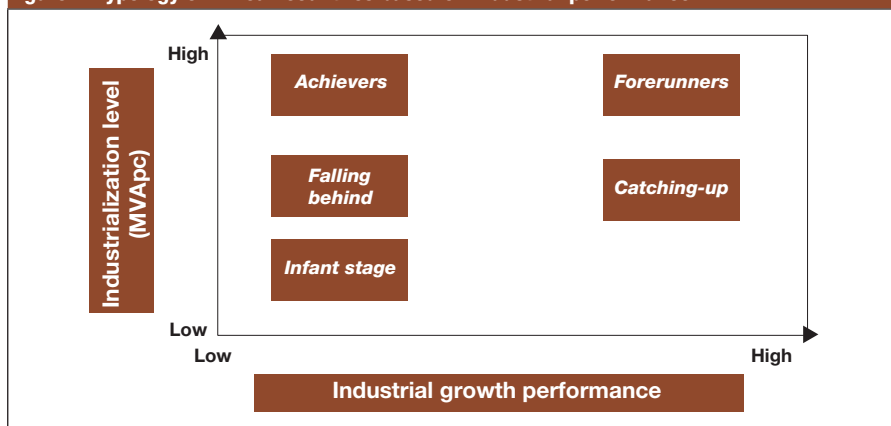
Based on these indicators, African countries can be divided into five groups (figure 7):

- The first group of countries (*Forerunners*) is on a long-term sustained-growth path with an industrialization level at least twice the African average and an industrial growth performance that is at least 2.5 per cent;
- The second group of countries (*Achievers*) also attained a comparatively high industrialization level in per capita terms. However, their industrial growth performance is below the 2.5 per cent threshold;
- The third group of countries (*Catching-up*) is on a fairly promising fast growth path which, if sustained, has the potential to take them to a substantially higher industrialization level in a relatively short timeframe;
- The fourth group of countries (*falling behind*) has a relatively low industrialization level and unlike the catching-up countries did not manage to achieve an industrial growth rate high enough to significantly improve their situation;
- The final group of countries (*Infant stage*) has a very low industrialization level as well as very poor industrial growth performance. Many countries in this group have had negative MVA per capita growth in recent years. It is not clear whether or not they can manage to initiate an industrialization process successfully. So far, their manufacturing capacity amounts to less than one tenth of the achievers and forerunners and there are very little signs of improvements in manufacturing growth performance.

Figure 8 shows where individual African countries fit in the five groups discussed above. It indicates that, while some countries have made significant progress in both industrialization level and industrial growth performance, the majority of African countries are seriously struggling to industrialize. Only 10 African countries have a

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Figure 7. Typology of African countries based on industrial performance



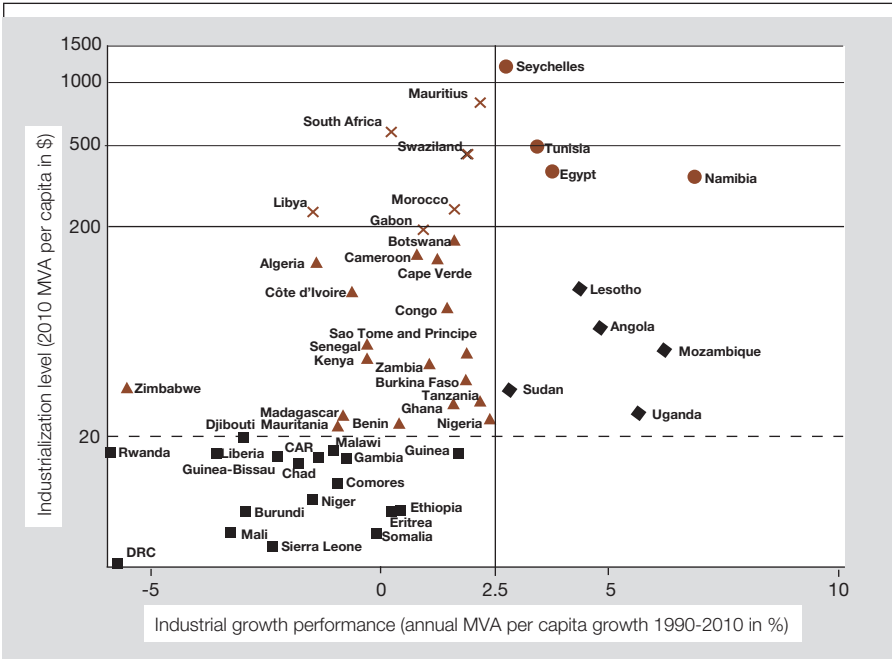
Source: UNCTAD/UNIDO.

relatively more advanced manufacturing base. Among these, 4 countries had an average annual MVA per capita growth rate of at least 2.5 per cent and are thus classified as forerunners while the remaining 6 are in the less dynamic achiever group. In addition, 5 are classified as catching-up countries. They have high industrial growth rates but have not reached the \$200 MVA per capita threshold level yet. Finally, 70 per cent of African countries (36 countries) have not made significant progress. Among these countries, 18 are in the falling-behind category with at least some existing manufacturing activities that they could build on while the others have MVA per capita of less than \$20 and hence no industrial base to build on. The geographical location of the countries in the different groups is shown in figure 9.

### Forerunners

Based on the data presented, Egypt, Namibia, Seychelles and Tunisia are the countries classified as Forerunners. Of the four countries, the experience of Seychelles is quite interesting. It has the highest MVA per capita level in the region and although it had an MVA per capita growth rate of 7.7 per cent in the period 1990–2000, its industrial growth was negative for the period 2000–2010. Consequently, its growth rate over the full period 1990–2010 was about 2.8 per cent. Of the four countries in this category, Namibia has the best industrial growth

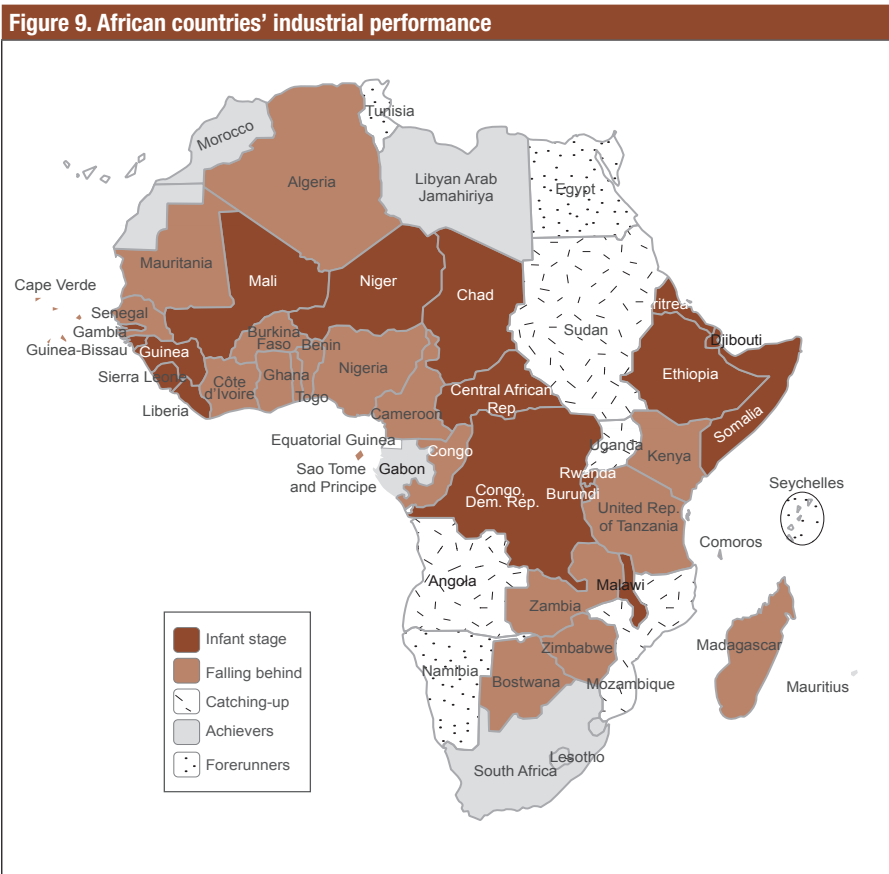
**Figure 8. An overview of African countries' industrialization level and growth performance**



Source: UNCTAD/UNIDO.

performance, with an average growth of 7 per cent between 1990 and 2010. In 1990, it had an MVA per capita of \$92, which was less than the figures for Morocco, the Libyan Arab Jamahiriya and Gabon. However, as a result of its impressive industrial growth, it has managed to surpass the MVA per capita level of these countries. Although Namibia has had an impressive industrial growth performance, it is heavily dependent on a few resource-based manufacturing activities. In particular, pearls and precious stones as well as uranium products account for almost two thirds of Namibia's manufacturing exports today. Consequently, a challenge for this country is how to move into medium and high technology manufacturing activities and or increase value addition in existing activities (Rosendahl, 2010).

The two North African countries (Egypt and Tunisia) have also made significant progress in industrialization. Their experience shows that it is feasible for African countries to substantially increase their manufacturing activities and eventually catch-up with more successful developing countries. Egypt expanded its manufacturing



Source: UNCTAD/UNIDO.

capacities rapidly during the last 20 years and thus increased its share of African MVA by more than 10 per cent. In the case of Tunisia, it almost doubled its manufacturing capacity in per capita terms during the last two decades and thus has an MVA per capita level close to that of South Africa. A critical challenge facing these North African countries is how to sustain and improve on their industrial performance, given the recent political turmoil in the subregion.

Egypt and Tunisia managed to develop a manufacturing sector with a relatively high share of GDP and also have an above average diversification into medium and high technology manufacturing and exports. In the case of Egypt, the chemical

industry is by far the most important sector among MHT manufacturing activities and accounts for more than one third of the country's MVA today. In addition, the machinery and electrical machinery industries also account for a considerable share of Egypt's manufacturing capacities (table 5). However, the country has made less progress in terms of structural transformation towards MHT manufacturing exports. In 2008, one third of Egypt's manufacturing exports stemmed from petroleum products, which are the country's major resource-based manufacturing exports. Fertilizers and other chemicals accounted for more than 10 per cent and electrical distribution equipment accounted for 3.5 per cent.

Due to the fact that Tunisia has a relatively large textile and apparel industry, its manufacturing activities are less focused on MHT industries than Egypt's. On the other hand, Tunisia is less reliant on petroleum products, which account for only 5 per cent of the country's manufacturing exports (dominated by apparel as well as several more technology intensive products such as fertilizers, electrical distribution and electric circuit equipment). Erdle (2011) ascribes Tunisia's progress in industrial development to its industrial policy as well as its geographical proximity to the European market. Despite the progress that has been made by the Forerunners, it should be noted that they still have to make up a lot of grounds in order to catch-up with the more advanced developing countries in Asia and Latin America.

## **Achievers**

South Africa is one example of the countries classified as Achievers. It accounted for about a third of African manufacturing capacities during the 1990s. In addition, with a 2010 MVA per capita level of \$581 it has a substantially higher industrialization level than other African countries, except Seychelles and Mauritius. Despite these achievements, it has had a very poor industrial growth performance the last two decades. In particular, its MVA per capita growth rate over the period 1990–2010 was 0.26 per cent, reflecting largely the fact that it suffered significant declines in industrial growth over the period 1990–2000. With regard to the other Achievers, Swaziland had MVA per capita growth rates of about 1.9 per cent over the last two decades while Morocco and Gabon had growth rates of 1.6 and 1 per cent respectively. The Libyan Arab Jamahiriya is the only Achiever that had a negative growth rate over the period 1990–2010. Although Mauritius had an MVA per capita growth rate of 4 per cent in the 1990s, its average growth over the period 2000–2010 was only 0.3 per cent. Consequently, its growth performance of 2.2 per cent over the full sample period 1990–2010 was not as strong as in the group of Forerunners.

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**Table 5. Industrial structure of selected African countries, 2009**

<b>Low Technology manufacturing country (LT share of MVA)</b>	<b>LT industry 1</b>	<b>LT industry 2</b>	<b>LT industry 3</b>
Mali (61%)	Apparel (47%)	Furniture and n.e.c. (9%)	Fabricated metal (5%)
Lesotho (55%)	Apparel (18%)	Leather (11%)	Printing (4%)
Nigeria (53%)	Furniture and n.e.c. (16%)	Fabricated metal (14%)	Textiles (10%)
Mauritius (48%)	Apparel (27%)	Textiles (8%)	Fabricated metal (7%)
Malawi (48%)	Fabricated metal (20%)	Printing (16%)	Textiles (8%)
Angola (41%)	Textiles (25%)	Fabricated Metal (6%)	Printing (6%)
<b>Medium and high technology manufacturing country (MHT share of MVA)</b>	<b>MHT industry 1</b>	<b>MHT industry 2</b>	<b>MHT industry 3</b>
Egypt (48%)	Chemicals (36%)	Machinery (5%)	Electrical machinery (4%)
South Africa (31%)	Chemicals (13%)	Motor vehicles (7%)	Machinery (6%)
Morocco (25%)	Chemicals (16%)	Machinery (3%)	Electrical machinery (2%)
Tunisia (22%)	Electrical machinery (9%)	Chemicals (7%)	Radio, TV, com. equipment (2%)
Tanzania, Untied Rep. of (26%)	Chemicals (25%)	Radio, TV, com. equipment (0.2%)	Electrical machinery (0.2%)
Nigeria (21%)	Motor vehicles (16%)	Chemicals (2%)	Electrical machinery (2%)
<b>Resource-based manufacturing country (RB share of MVA)</b>	<b>RB industry 1</b>	<b>RB industry 2</b>	<b>RB industry 3</b>
Ghana (86%)	Food (44%)	Refined petroleum (13%)	Wood (13%)
Sudan (84%)	Food (61%)	Refined petroleum (15%)	Rubber & plastics (2%)
Libyan Arab Jamahiriya (81%)	Refined petroleum (25%)	Tobacco (22%)	Food (19%)
Madagascar (79%)	Food (55%)	Refined petroleum (11%)	Tobacco (6%)
Gabon (76%)	Food (44%)	Refined petroleum (17%)	Wood (10%)
Kenya (68%)	Food (28%)	Glass & non-metallic minerals (16%)	Refined petroleum (15%)

Source: UNCTAD/UNIDO.

The case of the Libyan Arab Jamahiriya illustrates the specific challenges that Achievers face. Although it managed to build a sizeable manufacturing capacity in the past, it is falling behind most of the other North African countries because it has had negative manufacturing growth over the last two decades. This indicates that African Achievers definitely have to rethink their industrialization strategies if they do not want to fall behind more dynamic African countries and rapidly industrializing nations from other developing regions. While manufacturing activities already account for a relatively high share of the economies of Mauritius and Swaziland, they have not diversified their manufacturing base into medium and high technology sectors to a large extent yet. Thus, they need to seriously consider supporting entrepreneurial activities in more technology-intensive sectors in the future as this might be the only way to accelerate the expansion of manufacturing capacities. In this context, it has to be noted that Mauritius has already made some progress in expanding its activities in chemicals and machinery, as well as medical, precision and optical instruments manufacturing over the last decade. This has reduced its dependence on low technology (textile and apparel) sectors to a certain degree. Nevertheless, Mauritius still has a very strong focus on apparel as well as sugar and fish products, and telecommunication equipment is the only sizeable high technology product group in the country's manufacturing export basket. In summary, further industrial diversification efforts as well as the deepening of involvement in technology-intensive sectors is needed to re-accelerate the industrial growth of African achievers.

## **Catching-up**

While the Achievers and Forerunners already possess noteworthy manufacturing bases, many African countries are still at a catching-up stage of industrialization. Thus, they are more vulnerable to a sudden deterioration of their industrial growth path. For instance, despite its rapid industrial growth over the period 1990–2010, Sudan remains one of the least industrialized countries in the world and it is facing challenges because of its dependence on RB manufacturing as well as a slowdown in industrial growth in recent years. Angola also witnessed one of the most dynamic manufacturing growth processes of all African countries during the last two decades. However, with an MVA per capita of \$66, its industrial base is still very low. Thus, Angola's situation is similar to that of Sudan's in many respects. The Government is facing the challenge of how to promote industrial development given the fact that it has a thriving oil sector that largely overshadows manufacturing. A careful

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monitoring of industrial progress and a change in industrial strategy are needed to respond to the challenges and opportunities facing the country.

Industrial growth in Mozambique and Uganda has also been fast, although both countries still have very low MVA per capita. As in the case of Angola and Sudan, a continuation of the growth path of these countries cannot be taken for granted. In particular, efforts are needed to transform the few existing manufacturing activities into a well-established industrial base. Lesotho's industrialization progress is also relatively stable and is based on a strong labour-intensive, low-technology manufacturing sector. It is not clear whether it will manage to diversify its manufacturing activities towards more technology-intensive sectors that could complement the success of the apparel and leather industries in the future (table 5). Apart from achieving substantially higher MVA per capita growth rates than the African average, several catching-up countries also managed to further increase their growth rate during the last ten years compared to the period 1990–2000. For example, in the last 10 years, Angola and Mozambique had industrial growth rates of 13 and 8 per cent respectively. This indicates that these countries not only created the essential basic prerequisites to develop their manufacturing sectors but also successfully fine-tuned their approach as the industrialization process proceeded.

In summary, it should be noted that, despite their relatively good industrial growth performance, African catching-up countries have an MVA per capita level less than \$100. This means that they still need some time to develop a strong manufacturing sector. Currently, manufacturing does not account for a major part of their economies and medium and high technology activities do not play a major role in their manufacturing exports. In general, these countries have to monitor their progress and adapt to emerging challenges and opportunities in order to establish themselves as competitive industrial nations. The diversification of their manufacturing activities to encompass additional sectors and higher value-added processes will play a crucial role in accomplishing this goal.

### **Falling behind**

A large group of African countries are increasingly falling behind the more successful groups discussed above. Most of these countries have an MVA per capita level below the African average of \$100 and did not show considerable industrial growth during the last 20 years (figure 8). In general, these countries are

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characterized by a strong reliance on unprocessed natural resource exports and low contribution of manufacturing activities to GDP. In addition, food production and petroleum refining dominate the industrial activities of these countries.

The countries in this group have not made significant progress in industrialization. In both Kenya and Senegal, for instance, MVA per capita stagnated at about \$50 during the last 20 years. In addition, manufacturing value added accounts for about one tenth of their GDP and the existing manufacturing activities are almost exclusively in resource-based sectors. While Senegal is strongly dependent on the export of manufactured petroleum products, Kenya's MVA and manufacturing exports are strongly concentrated in the food and non-metallic mineral sectors. Although Botswana stands at a slightly higher industrialization level and has had moderate industrial growth, it is also heavily dependent on resource-based manufacturing. In fact, MVA accounts for only 4 per cent of its GDP and more than 90 per cent of its manufacturing exports stem from diamonds and nickel processing. In order to reap the full benefits of industrial development, these countries should consider substantially increasing their efforts to support manufacturing activities in general. However, they also need to simultaneously start to build the basic technological capabilities that are essential to move to more technology intensive sectors at a later stage.

The experience of Cameroon shows that it is possible for African countries in this category to reduce their dependence on resource-based manufacturing. Cameroon has developed its textile industry during the last couple of years and reduced its dependence on wood products substantially. With regard to their growth performance and industrial structure, the United Republic of Tanzania and Nigeria are exceptions in this group of countries. Although both countries had MVA per capita growth slightly below 2.5 per cent over the period 1990–2010, they had rapid industrial growth in the last decade. In particular, the United Republic of Tanzania had a growth rate of 4.8 per cent and Nigeria 6.2 per cent in the period 2000–2010. Furthermore, both countries are more active in technology-intensive sectors than other countries in the same group. While the United Republic of Tanzania diversified into the chemical industry, which now accounts for one quarter of its total MVA, Nigerian activities in the motor vehicles, chemicals and electrical machinery sectors account for about one fifth of its total MVA.

In summary, this group of countries is characterized by several cases of deteriorating growth performance and some cases of de-industrialization. Cote d'Ivoire, Senegal and Mauritania have a lower MVA per capita level today than

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they did 20 years ago. But the most serious case of de-industrialization in this category is Zimbabwe, which seems to be caught in a downward spiral with a substantially lower MVA per capita today than 20 years ago. Furthermore, in the last 10 years, its manufacturing output per capita decreased by more than 8 per cent. The case of Zimbabwe points to the importance of political stability in the industrial development process.

### Infant stage

The last group in the typology (the Infant stage) comprises a large number of countries that have either relatively insignificant or no manufacturing base. These countries have an MVA per capita of less than \$20 and are mostly countries classified as Least Developed Countries (LDCs). Some of the countries in this category include Rwanda, the Democratic Republic of the Congo, Burundi, Mali, Sierra Leone, Liberia, Niger, Guinea, Guinea-Bissau, and Djibouti. These countries face the risk of being further marginalized in the global as well as the African manufacturing landscape.

In general, manufacturing firms do not play a significant role in domestic value addition or export activities during the Infant stage. However, in Niger and Guinea, the share of manufacturing exports in total exports is quite high. In the case of Niger, the high share of manufactures in exports stems almost exclusively from the export of uranium products, which account for more than 86 per cent of manufactured exports. In Guinea, aluminium products account for over 90 per cent of manufactured exports. Although these product groups are classified as resource-based manufacturing exports, they still resemble primary commodities in the sense that their value stems mostly from the raw material rather than the limited manufacturing value addition. This also explains the fact that both countries have very small shares of MVA in GDP.

There are also positive developments in manufacturing development in some countries in this group. For example, Ethiopia has made progress in the development of the horticulture industry. Its rank among top exporters of cut flowers improved from 24<sup>th</sup> in 2001 to 5<sup>th</sup> in 2007 (Sutton and Kellow, 2010). Malawi has also made some progress in the development of the textile and apparel sector. Despite these positive developments, it is evident that countries in this group are facing serious challenges in initiating and developing manufacturing industries. It is unlikely that they will make significant progress in this area without deliberate government action to give industrial development a big push.

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## **E. APPLYING THE FRAMEWORK: LINKING COUNTRIES WITH DIFFERENT STRATEGIC CHOICES**

With the help of this framework, industrial policymakers can understand their countries' relative position in the relevant industries in order to define an industrial strategy that covers industrial expansion/upgrading, diversification and deepening measures. Although this Report does not include a detailed diagnosis of individual African countries' industrialization patterns, it is possible to suggest some general policy directions based on this typology. In short, different types of African countries need to consider different alternatives with regard to the mix of expansion, upgrading, diversification and deepening measures. Thus:

- African Forerunners already developed sizeable manufacturing activities and are on a sustained industrial growth path. This indicates that measures to expand the existing production capacities will probably have a lower priority than deepening measures that aim at creating linkages and complementarities among the individual firms within the key industries. Thus, measures to improve coordination between large and small firms as well as domestic and foreign or State-owned and private firms in the most attractive industries deserve particular attention in the strategy design process. In addition, medium-term diversification measures aiming at industries with higher technological intensity and value addition have to be taken very seriously. Considering the countries' comparatively more advanced stage of development, early sectors such as apparel and resource-based manufacturing will probably reveal diminishing growth potentials in the near future. In this case, it will be crucial to accomplish the shift towards sectors that still offer considerable growth prospects – e.g. late sectors such as machinery and equipment or precision instruments. This re-allocation process will, however, be contingent on extensive improvements in the countries' technological capabilities, which in turn require time. Accordingly, the governments have to consider these long-run prospects already now in order to warrant a smooth transition in the future. The specific attractiveness of individual industries will, however, depend on country characteristics as well as a judgement on the trade-off between economic, social and environmental considerations. A close dialogue between the government and private sector, as well as academia and market experts – possibly facilitated by an independent mediating organization – is an essential success factor for this undertaking;
  - African Achievers are in a somewhat similar situation as far as their industrialization level is concerned. Thus, diversification measures to
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accelerate the shift from early to late sectors that has been discussed in the context of Forerunners are at least equally important. Actually, the fact that they did not accomplish this transition to a large degree yet might be one of the explanatory factors for their deteriorating growth performance in recent times. For this reason, measures to facilitate the advancement of technological capabilities and entrepreneurial activities in new manufacturing sectors should be addressed with high priority in these countries. To complement these diversification efforts, measures to foster more complex activities *within* core industries through processes of technological advance and organizational learning could be considered. Bearing in mind that the per capita output did mostly stagnate in these countries recently, industrial upgrading efforts have the potential to enhance productivity which in turn translates into increased output performance. Next to product and process upgrading, functional upgrading to enter into high-margin segments of the production chain that domestic firms are not covering yet – e.g. design, marketing and logistics – seems particularly promising in this respect;

- African Catching-up countries stand at a considerably earlier stage of industrial development and might thus consider a somewhat differing focus in their industrialization strategy. While they recorded remarkable growth rates in certain industries over the past two decades, these successes are mostly based only on the activities of a small number of firms. Thus, it seems likely that the countries are not exploiting their full potential in these sectors yet – making capacity expansion measures a promising strategic option. On top of that, it is also critical to estimate the prospects of deepening measures to create linkages between the few dynamic large firms on the one hand and the large number of mostly unorganized or informal small companies on the other. In contrast, although upgrading measures could also be considered, it needs to be ensured that highly sophisticated process or functional upgrading targets will not overburden the private sector, which does not have advanced technological capabilities at its disposal yet. As far as diversification strategies are concerned, the respective stakeholders have to assess the potentials that new sectors could offer and critically examine their strategic feasibility. However, while activities in the machinery or precision instruments industries are possibly in relatively easy reach for Forerunners or Achievers, they will require substantial and prolonged efforts from Catching-up countries. Presumably labour-intensive activities could be identified as medium-term targets while selected technology-intensive sectors might offer long-term prospects;
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- African countries that are Falling behind as well as Infant stage countries are in general facing more fundamental challenges than the groups discussed above. For example, given the fact that there is not a critical number of firms in most manufacturing industries, it has to be called into question whether deepening measures should have a high priority at this stage. Instead, strong government initiatives to support the emergence of entrepreneurial activities as well as the generation of basic technological and managerial capabilities could be considered. While diversification strategies that target more complex sectors are definitely important to develop a long-term vision, immediate action could be perceived to deserve a higher priority in these countries. In this case, it will be particularly important to identify unused potentials in manufacturing activities that are attractive and feasible for these countries in the short-run. Accordingly, it is promising to learn from the past experiences of more advanced industrializers that have similar characteristics in order to identify potential easy diversification gains. In addition, it is conceivable that the existing resource-based manufacturing activities are already exploiting the existing output potentials to a relatively large extent. Thus, on the one hand, mere capacity expansion measures in these less attractive sectors might not be sufficient. However, on the other hand, it is still advisable to investigate opportunities for upgrading in these sectors. For example, moving from natural resource extraction or agricultural commodity production to a higher degree of processing could be a promising starting point.

## F. STEPS IN THE INDUSTRIAL STRATEGY DESIGN PROCESS

Based on this international benchmarking framework, industrial policymakers have to understand their countries' relative position in order to define an industrial strategy that covers manufacturing capacity upgrading, diversification and deepening issues. Thus, the following five steps are essential for the design process of a forward-looking strategy that aims at sustainable industrial development:

1. *The identification of the most relevant comparators (country-benchmarks) for the given country case*

In most cases, policymakers tend to look at the most successful cases of industrial development when designing national industrial development strategies. This means that many African countries aim to imitate the

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development paths of countries such as the Republic of Korea or China. However, from an economic perspective, it makes more sense to carefully select benchmarks that more closely resemble their country. Structural change analysis is an approach to pursue this exercise. So far, the selection is based on three exogenous variables (country size, resource endowments and population density). UNIDO is currently developing a more detailed classification based on additional variables.

*2. The identification of the most relevant industries for the given country case at its current and future stages of development*

So far, this identification is based on industries' relative growth potential (i.e. sectoral growth elasticity), considering stage of development and endowments (country size, resource endowments and population density). Potentially, additional information will have to be included in the analysis in order to provide a more accurate picture and cover other aspects of development as already indicated in the general framework in this Report – for example, industries' relative effect on a country's employment creation (i.e. sectoral employment elasticity), environmental sustainability, gender mainstreaming, and so forth.

*3. A comparative assessment of a country's relative performance in the identified most relevant industries (i.e. the level of efficiency in each industry) in relation to the identified comparators*

This analysis helps us to understand a country's performance in a selected industry relative to its country-comparators with the same endowment structure and development stage as well as the global average. In this way, it helps us to understand whether countries are using their current potential in these industries in an efficient way. Essentially, the currently unused potentials or, in other words, the latent comparative advantages of a country, as well as future potentials can be identified.

*4. A comparative assessment of the structure of a country's manufacturing portfolio in relation to its identified comparators*

Apart from the comparison of a country's production capacity in individual industries, it is also important to compare the structure of MVA of a given country case with the manufacturing structure of its comparators, when they were at the same stage of development. This exercise enables us to identify the sectors which can be considered the most severe impediments to this

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country's manufacturing performance, or in other words, the country's most serious structural bottlenecks. In the above framework, this means that we compare all sectors at a single strategic feasibility level (e.g. "immediately") and identify the sectors which are most severely underrepresented.

*5. The prioritization of the actions needed to facilitate a sustainable industrialization, both in the short and long run*

Due to resource constraints, African countries are not able to focus on all lagging manufacturing activities simultaneously. Thus, they have to consider the sectoral evolutionary path<sup>12</sup> (growth and decline) of individual sectors and conduct a feasibility study to prioritize their actions based on their current capabilities and endowments. Based on the country's capacity and structural performance in the most relevant sectors (steps 3 and 4), it is possible to prioritize the most urgent actions. This can cover a prioritization of the immediate as well as the long-term demand for action.

The next chapter will take up in more detail the why and how of industrial policy design. But to conclude this chapter, it must be stressed that the processes of industrial diagnosis and industrial strategy design, which have been discussed here, need to be embedded within a pragmatic approach to policy formulation which gives priority to policy learning and consultation. One of the most critical success factors for this undertaking is collaboration among the key stakeholders. On the one hand, a top-down approach with the government dictating the priorities is not advisable because African governments do generally not have all the relevant information about potentials in all manufacturing activities at their disposal (Altenburg, 2011). Furthermore, from a political economy perspective, rent-seeking behaviour and adverse incentives should never be underestimated (Robinson, 2009). On the other hand, a collective decision-making process still requires a committed and visionary leader as well as a supporting technocratic elite that takes responsibility for the industrialization path of the country. This leadership is also essential for the coordination of the relations among all stakeholders, including various ministries and agencies, central and local governments, the private sector as well as donors (Ohno, 2009; UNCTAD, 2009c). In sum, the design of an anticipatory and selective industrial strategy can only be successful if the search and prioritization process is participatory, transparent and collaborative. Industrial diagnosis and international benchmarking need to be integrated with close consultation between the government and private sector.

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