

INDUSTRIALIZE AFRICA

Strategies, Policies, Institutions, and Financing



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FOREWORD

BY AKINWUMI AYODEJI ADESINA

AFRICA'S TIME IS NOW!



*President,
African Development
Bank Group*

*That is
the end
goal! We
must not
slow down.
Africa's
time is now!*

“ The secret of the wealth of nations is clear: developed nations add value to everything they produce, while poor nations export raw materials. Africa must quit being at the bottom of the global value chains and move to rapidly industrialize, with value addition to everything that it produces. Africa must work for itself, its people, not exporting wealth to others.

Industrialise Africa is one of five accelerators of the African Development Bank. The others are Feed Africa, Light Up and Power Africa, Integrate Africa, and Improve the Quality of Life for the People of Africa.

I firmly believe that if Africa focuses on these High 5s, the continent will achieve 90% of its Sustainable Development Goals and its Agenda 2063 goals. This is why Industrialise Africa is at the heart of the African Development Bank's High 5s.

To industrialise Africa, the African Development Bank is committed to mobilising capital, de-risking investments for the private sector, and leveraging capital markets. This is essential for moving Africa's Industrial agenda forward and for building an Africa of the twenty-first century that is well positioned to take its place in global value chains.

Africa is certainly the place to do business today. We have a rapidly growing young population, and an increasing demand for consumer goods, food, and financial services. Together, these factors make Africa an attractive business and industrial proposition for the private sector.

Diversification is not a goal. It is the outcome of well-planned policies for the structural transformation of economies. No region of the world has moved to industrialized economy status without passing through the transformation of the agricultural sector. This is the formula: agriculture allied with industry, manufacturing and processing capability, equals strong and sustainable economic development and wealth creation throughout the economy.

The bottom line is that we need to produce more and we need to produce better. Most of all, we need to add value to our resources and raw materials, and turn them into processed products. ”



Unidentified women sell vegetables on the road to Murchison Falls on December 9, 2007 near Masindi, Uganda. Kampala, Uganda-April 2017 ©2017. Shutterstock images



INTRODUCTORY REMARKS:

PROMOTING SUSTAINABLE INDUSTRIAL POLICIES

Joseph E. Stiglitz



Joseph E. Stiglitz

2001 Nobel Laureate in Economic Sciences and member of the Special Panel on Accelerating the Implementation of the African Development Bank Ten-Year Strategy. Professor, Columbia University

1 MARKET INEFFICIENCY

For several decades, the Washington Consensus dominated development thinking, and industrial policies were discredited under the prevailing belief that markets would solve all problems. Early in 1978, I gave a lecture, titled “Broader Objectives, More Instruments” at the World Institute for Development Economics Research (WIDER), in which I criticized the policies of the Washington Consensus to make that point. Not everyone agreed with me at that time. Fortunately, the set of ideologies and views about how the economy operates and the one-size-fits-all policies advocated by the Washington Consensus are now largely discredited.

There have been many facts that brought us to understand the limitations of markets. The economic crisis in 2008 was the coup de grâce, because it showed that markets, in their own right, were neither efficient nor stable. And the countries that were most successful in development—and let me emphasize that there have been enormous successes in development, well beyond anything that anybody had ever anticipated—especially, those in East Asia, did not follow the Washington Consensus whereas the countries that followed the Washington Consensus suffered.

One of the questions that I get asked very often is: Why did Africa do so poorly in the quarter century before 2000? Why, when East Asia had enormous success in industrialization, was there the process of de-industrialization in Africa? While there were several factors contributing to it, I believe the most important cause was the structural adjustment policies that were imposed by international economic institutions. Structural adjustment policies advocated by the IMF and the World Bank were predicated on the belief that by eliminating “distortions” in the economy, Africa would grow faster by constructing an economy based on principles of free and unfettered markets. In reality, these structural adjustment policies foisted on developing countries have actually discouraged indus-

trial development and stifled growth, and the result is that, over the past 30 years, Africa has suffered from de-industrialization.

A few years ago, Ben Bernanke, then Chairman of the Federal Reserve of the United States, talked about a “savings glut,” by which he meant there was too much savings. When he said that, I thought he must have been living on a different planet than I was living on. Because when I traveled around developing countries, even when I went to New York, what I saw was huge investment needs for infrastructure, for technology, for retrofitting the world for climate change and for human capital. I continue to see huge investment needs, and yet, Bernanke was talking about too much savings! This is another example of market failure. One of the important markets in the economy, namely the financial market, is supposed to mediate between savings and investment, but it is failing to do so. Let me explain: the investment needs that we have for infrastructure and retrofitting the world for climate change are long term, and much of the savings, such as sovereign wealth funds and people’s savings for retirement, are also long term. Yet, in between, there are financial markets that are not showing concern about the next quarter, or not even the next hour. So, there is something wrong in an economic system in which short-term financial markets are trying to mediate between long-term investment and long-term savings needs.

Meanwhile, the neoliberal/neoclassical model suggests that there is only limited importance to be attributed to market failures, but global warming and climate change has made us recognize that there are some first order important externalities of market failures that are threatening the very survival of our civilization. So, it is not only that there were conventional market failures that demonstrated how markets have not managed risk and that markets were inefficient and unstable, but also markets are failing to help the world address the key issue of global warming.

These are all examples of the ways in which the markets do not work well, or simply examples of market failure. This clearly points in a direction that there is a need for governmental policies.

2 THE INEVITABILITY OF INDUSTRIAL POLICIES

Often when people talk about industrial policies, they are thinking about manufacturing, but industrial policies have a far broader agenda than only industrialization, narrowly defined, and merely increasing GDP. The view of industrial policies has to be broadened. I view industrial policies as any government policies that affect sectoral composition or choice of technology or direction of innovation. They can be energy policies, modern service sectors, and many other aspects that promote a whole range of non-traditional activities and non-traditional technologies.

Thus, industry is not just about manufacturing. Although there are real advantages to developing a manufacturing sector, because it is an important way of moving from agriculture into a more advanced economy, we have to be realistic that the overall number of jobs in manufacturing globally is going down. This decrease is the result of the success of the manufacturing sector. Productivity in manufacturing is increasing faster than the output of manufactured goods, which means not every country can have an increase in manufacturing jobs. There will be, or has been, a significant decrease in manufacturing employment in countries like the United

States and in Europe, and they will have to accept and adapt to that kind of decrease. The increase in the cost of labor and the changing comparative advantage means that manufacturing is moving elsewhere. An institution like the United Nations Industrial Development Organization (UNIDO) can play an important role in helping some of the countries, for instance, in Africa, to seize a larger fraction of those jobs that are going to be moving from where there are today. There have been big successes in some African countries, for instance, in Ethiopia, where 50,000 jobs have been created in the shoe industry. This is a real success for industrial policies.

Governments are inevitably involved in industrial policy. Markets do not exist in vacuums; instead, they have to be structured. Markets and governments must be viewed as complements, as working together. All governments have to make decisions about expenditure policies, tax policies, and which infrastructure to invest in. These policies favor one industry over another, one technology over another, and their infrastructure decisions affect one over another.

So, I want to emphasize that every country has industrial policies. In the United States, many people do not believe in industrial policy. The truth is, of course, that it has an industrial policy—the industrial policy that the United States has had for the past 25 years has been to encourage the financial sector. A case in point is the



Happy school children © 2017. African Development Bank Group

bankruptcy law. In many countries, in the event of bankruptcy, the law states clearly who gets paid when the debtor cannot pay all his debts, whereas in the United States the laws give priority to derivatives. That is an example of industrial policy. Also, the policy of privatization is, or can be, an industrial policy, because it favors some sectors over others. The result of this set of policies in the United States has led to the growth of the financial sector, which has grown from around 2.5% of GDP to around 8% of GDP. As a teacher, I feel this very strongly, because our most talented students are going into the financial sector and real estate speculation, rather than into more productive activities.

And think about what were the most important innovations at the end of the 20th century. One of them was the Internet, which, basically, resulted from one of the industrial policies of the US government. It was a very successful industrial policy, and it was the basis of what has continued to be one of the important sources of our economic growth. Many of these industrial policies in the United States are admittedly hidden in the Defense Department, but they are still important.

In short, all governments have industrial policies, explicit or otherwise. The only difference is between those who construct their industrial policy consciously and those who let it be shaped by others, typically, special interests, which vie with each other for hidden and open subsidies, for rules and regulations that favor them over others.



A welder in Morocco © 2017. African Development Bank Group

In this regard, UNIDO has been very good at emphasizing that the issues of industrial policy do not apply just to developing countries and the least developed countries, but also to advanced countries. In addition, I think the focus of UNIDO should be on helping countries figure out good industrial policies—policies that will promote inclusive sustainable growth and are consistent with the Sustainable Development Goals. Just as I said in one of my talks in 1998, we ought to be promoting equitable, sustainable, and democratic development. All of these issues are interrelated.

Development is, to a large extent, a structural transformation; it is not just growth, it is changing the structure of the economy. There are many dimensions to structural transformation. One aspect is that we are moving towards a green economy, a learning society, and an innovation economy. In one of my more recent books, titled *Creating a Learning Society*, I talked about how industrial policies can help structure the economy. I call it a “learning society,” because it is more than a learning economy—it is the way our whole society interacts.

In the developing countries, they are moving from agriculture to manufacturing. In many of these countries, there is a process of moving toward an urban economy. This year marks the first year in which a majority of the world’s population will probably be living in cities, and that is a very big transformation. In advanced countries, there are other aspects of structural transformation insofar as they are moving toward service sector economies. In all of our economies, we should be moving from a finance-based economy to a real economy, and we should put emphasis on inclusive growth and inclusive industrial development.

Ironically, one of the problems facing the world today has to do with innovation. There is something very peculiar about the nature of innovation going on today, especially, in the developing countries in which the real challenge is job creation. Innovation across the globe is largely focused on saving labor, which goes in exactly the wrong direction. If employment does not increase, then inequality will, and if inequality increases, then aggregate demand will become weak. If aggregate demand is weak, then GDP growth will be weak. This is a vicious circle.

To prevent this from happening, it is very important for us to frame policies that shape the direction of technology. We need to encourage innovation, which is focused on saving the planet and protecting the environment and less involved in saving labor. If we want to have sustained economic growth, we have to make sure

that the industrial policies framed should create employment and shared prosperity, as well as save the planet.

3 INSTRUMENTS FOR SUSTAINABLE INDUSTRIAL POLICY

Admittedly, there are many tensions between global agreements and the logic of modern economics, tensions between what developing countries and emerging markets need and the global agenda, which is, to some extent, stifling industrial policy. Countries have to learn how to deal with and navigate this difficult terrain.

For example, one tension is in education. When I was a Chief Economist at the World Bank, one of the important aspects of the advice that we gave to countries and programs, which we supported, was about education. Most of the education advice that was given to countries was that they should focus their scarce resources for education on primary education. Although that policy made some sense, because resources were limited and that meant everyone was given a small amount of education, it actually was a recipe for making sure the countries did not develop. Countries could not develop, based on just primary education for its peoples. Instead, people who have secondary and university education were needed. Countries, such as Korea and China, and most of the East Asian countries, realized this need in their development strategies. Therefore, we should adopt a broader education strategy, one that can help countries succeed.

Another example of tension lies in trade policy. We have come to realize that many trade policies have actually stymied development instead of promoting it. One of the ways in which advanced countries have done well for such a long time is what I call escalating tariffs—tariffs on unfinished goods, namely raw materials, have been lowered whereas tariffs on finished goods have been increased. As a result, developing countries are forced to stay at the lower level of the value-added chain. The development round, like the Doha Round, was supposed to stop such tactics of the advanced countries—who try to maintain the status quo of developing countries providing only raw materials—but, unfortunately, the development round failed to address this problem.

There are multiple instruments that are at the disposal of governments and the international community for promoting industrialization, broadly defined. One of them is creating a learning society. My colleague Bruce Greenwald and I have tried to define a broad agenda for creating a learning society. There are multiple strategies for doing that, and it has been successful in several countries.

In the book, we show how well-designed government trade and industrial policies can help create a learning society, and how poorly designed intellectual property regimes can retard learning.

Each government policy has effects, both positive and negative, on learning, a fact that policymakers must recognize. Many standard policy prescriptions, especially those associated with “neoliberal” doctrines that focus on static resource allocations, have impeded learning. Broad-based industrial policies may bring benefits, not just to the industrial sector but to the entire economy. One of the instruments is exchange rate interventions. China has used a competitive and stable exchange rate very effectively.

Another important set of tools involves development banks. Twenty years ago, the World Bank, even though it was a development bank, said development banks were not a good idea. We understand now that they are important. There are many successful development banks, and some very important new development banks, such as the BRICS Development Bank and the Asia Infrastructure Investment Bank. They are going to play an important role in providing finance for industrialization.

Another point in this broad area of instruments is in promoting a sustainable industrial policy; we need a tax on carbon. I think developing countries, emerging markets, and advanced countries that want to promote sustainability will have to have a price on carbon, which should have been sought at the Climate Summit in Paris.

Meanwhile, the strengthened versions of traditional instruments can also play an important role in industrial policies. Traditional instruments, like anti-trust policies, can also be considered to be part of industrial policies. When I was at the World Bank, we formulated what was called the Comprehensive Development Framework (CDF).

The issues of development are so complex that there is no magic bullet; we cannot approach them with any single tool. Instead, we need a comprehensive approach with a comprehensive industrialization framework and toolkit, adapting to the circumstances of the individual country.



South Africa . 2015 . Xina Solar Plant ©2017. African Development Bank Group



SECTION 1



INDUSTRIALISE
AFRICA:
HOW TO DO IT



GIORGIO
ATHLETICWEAR



CHAPTER 1

INDUSTRIALIZATION: A PRIMER

Célestin Monga



Célestin Monga

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In one of his most celebrated novels, H.G. Wells derided a society of super-intelligent people, who constantly came up with amazing ideas and did extraordinary things, and yet could not invent the basic wheel... Many of today's theorists of African industrialization are reminiscent of Wells' brilliant characters who could see and master complex problems on the horizon and yet failed to invent the basic wheel or solve issues right in front of them. Africa is indeed performing remarkably well in many important fields that are underpinning and driving globalization, often at the cutting edge.

In fact, some of the innovative schemes and processes driving what is now referred to as the Fourth Industrial Revolution were designed and experimented successfully in Africa—before being exported to the rest of the world. Examples of welfare- and productivity-enhancing technologies and processes conceived in Africa and now conquering the world abound, including the famous M-Pesa, which has boosted the development of mobile money applications that allow clients to store value in an account accessible by a mobile phone handset, transfer cash in and out of the stored value account, and transfer value between users and businesses (Aker and Blumenstock 2015). Yet, just like in Wells' utopian fiction, African leaders and elites seem more interested and successful in reaching the moon and solving problems there than in addressing the urgent, basic problems in front of them—hunger, malnutrition, poor-quality education, weak welfare systems, unemployment, underemployment, and their corollary, which is pervasive and unacceptable levels of poverty.

Modern economic growth is a process of continuous technological innovation, industrial upgrading and economic diversification. Virtually no country in the world has been able to move from low- to middle- and high-income status without undergoing the process of industrialization. Structural transformation is always taking place because of changes in technology, in comparative advantage, and in

the global economy. In the particular context of low-income countries, policymakers must aim at two main medium-term objectives: ensuring that resources (labor, capital, knowledge) are transferred from low- to high-productivity sectors and areas, including the migration of abundant unskilled rural labor to unskilled labor-intensive industries; and increasing productivity through knowledge and learning.

There is now wide recognition among researchers that the type of industrialization that can foster such positive structural transformation does not occur spontaneously. Smart industrial policy—defined as a policy by which governments attempt to shape the sectoral allocation of the economy—must be in place to correct market failures (situations where markets by themselves do not lead to efficient, or desirable, resource allocations) or even to correct other government failures (public policies that excessively “distort” resource allocations). But industrialization and industrial policy are still controversial—especially in times of rapid technological developments and changing economic production structures.

1 WHAT IS INDUSTRIALIZATION AND WHAT ROLE DOES IT PLAY IN ECONOMIC DEVELOPMENT?

Industrialization has always been an important topic of development thinking since the latter emerged after World War II. At times, it has been celebrated, challenged, and even discredited, but it has never been absent from the successive intellectual and policy debates on economic change. Today, after decades of intellectual disputes, there is wide consensus among economists that industrialization is the single most important driver of structural change. The two concepts are indeed closely linked: structural transformation is the phenomenon whereby a society's resources are moved from the sectors where they yield little economic benefits to those where the payoffs are the highest—and this occurs through industrialization. Indeed, prosperity is achieved in any country only when

a country's resources (human, natural, and capital) are shifted from subsistence and informal activities into high-productivity activities.

Industrialization dynamics is therefore an unavoidable feature of structural transformation. It has long been recognized as one of the main engines of sustained economic growth, especially in the early stages of development.¹ Its essential characteristics include: (i) an increase in the proportion of the national income derived from manufacturing activities and from secondary industry in general, except perhaps for cyclical interruptions; (ii) a rising trend in the proportion of working population engaged in manufacturing; and (iii) an associated increase in the income per head of the population (Bagchi, 1990). Few countries have been economically successful without industrializing. Only in circumstances such as extraordinary abundance of natural resources or land have there been countries that could do so (UNIDO 2009).

The economic development of today's industrialized countries was almost universally accompanied by an increase in agricultural productivity in the initial stages of development. Sustained economic development typically requires that agriculture, through higher productivity, provides food, labor, and even savings to the process of urbanization and industrialization. A dynamic agricultural sector raises labor productivity in the rural economy, pulls up wages, and gradually eliminates the worst dimensions of absolute poverty.

Agricultural growth also stimulates growth in non-farm sectors, thus driving structural transformation and industrialization processes. The development of a competitive industrial sector yields an even higher payoff. Economists have established that, at least since the early 1960s, manufacturing has always played a larger role in total output in richer countries, and that countries with higher incomes are typically those with substantially bigger economic contributions from the transport and machinery sectors. The countries that manage to pull out of poverty and get richer are those that can diversify away from agriculture and other traditional products.

Industrialization is an ever more powerful engine for economic and social change in the context of globalization, as it provides an almost infinite potential for growth—especially for many low-income countries. It has always played a key role in growth acceleration processes that are sustained over time and eventually transform economies from “poor” to “rich.” Whereas economic growth based

on exploitation of natural resources or agricultural land eventually faces the constraint of shortages of quantity, a development strategy based on producing manufactured goods for the global market benefits from economies of scale due to increasingly lower unit costs of production.

In the early phases of modern economic growth, which started with the Industrial Revolution, manufacturing played a larger role in the total output of successful countries and their higher incomes were associated with a substantially bigger role of transport and machinery sectors. Throughout the nineteenth and twentieth centuries, countries in North America, Western Europe and Asia were able to transform their economies from agrarian to industrial powers, which included a rapidly growing services sector fueled in large part by the multiplier effect of manufacturing. As a result, they built prosperous middle classes and raised their standards of living.

Besides the generally much higher levels of productivity in industry (especially manufacturing) than in traditional agriculture, the main reason for the growth in industrialization is the fact that its potential is virtually unlimited, especially in an increasingly globalized world. As agricultural or purely extractive activities expand, they usually face shortages of land, water or other resources. In contrast, manufacturing easily benefits from economies of scale: thanks to new inventions and technological development, and to changes in global trade rules, transport and unit costs of production have declined substantially during the past decades, which also facilitates industrial development. Several decades ago, low-income countries faced the constraints of their limited market size, high transportation costs, and trade barriers, and could not take advantage of the opportunities offered by manufacturing. With globalization, virtually any country can identify products for which it has overt or latent comparative advantage, facilitate the entrance of its firms into global value chains (GVCs), and scale up production almost without limit, thereby creating its own niche in world markets. Today, almost any small country can access the world market, find a niche, and establish itself as a global manufacturing place. For example, Qiaotou and Yiwu, two once-small Chinese villages, have become powerhouses, producing more than two-thirds of the world's buttons and zippers, respectively!

Industrialization also promotes inclusive development by expanding the fiscal space for social investments. In such a context, fiscal

¹ Earlier analyses of the process, dating back to the 1950s and 1960s (Datta, 1952; Kuznets, 1966), found that manufacturing specifically tends to play a larger role in total output in richer countries—a pattern corroborated by the UNIDO report (2009)—and that higher incomes are associated with a substantially bigger role of the transport and machinery sectors.

revenues are likely to increase due to: exports of higher value added, rising profits of companies, and better incomes earned by more productive and innovative labor force. Within the industrial sector, manufacturing has evolved and changed the dynamics of the world economy. Profound changes in geopolitical relations among world nations, the widespread growth of digital information, the decline of transportation costs, and the development of physical and financial infrastructure, computerized manufacturing technologies, and the proliferation of bilateral and multilateral trade agreements have contributed to the globalization of manufacturing. These developments have permitted the decentralization of supply chains into independent but coherent global networks that allow transnational firms to locate various parts of their businesses in various places around the world. The creative design of products, the sourcing of materials and components, and the manufacturing of products can now be done more cheaply and more efficiently from virtually any region of the planet while final goods and services are customized and packaged to satisfy the needs of customers in faraway markets.

The globalization of manufacturing has thus allowed developed economies to benefit from lower-cost products driven by the lower wages used for production in developing countries such as China, India, Bangladesh, Costa Rica, Mexico, or Brazil while creating job and learning opportunities in these formerly poor nations. The intensity of these exchanges has led to new forms of competition and co-dependency.²

For African countries, the need for sustained, inclusive growth has never been more urgent. The growth dividends have not materialized for many people, who are getting impatient. Fortunately, new opportunities for rapidly achieving more-broadly-shared economic success are on the horizon. Globalization and the continued progress of large emerging economies such as China, India, Brazil, and a few others, are freeing up unprecedented possibilities for industrialization of low-income economies in Africa and elsewhere. The popular belief that economic progress in these large developing countries (China in particular) is hurting industrialization in lower-income regions such as Sub-Saharan Africa is wrong. In a global economy of more than 7 billion consumers and counting, trade of manufacturing goods is not a zero-sum game. In fact, with the constantly enlarging global market for manufacturing goods, the “pie” keeps growing bigger and any developing country could find its niche—provided that it specializes in the production of goods that are consistent with its comparative advantage, and implements pol-

icies that ensure the rapid development of competitive domestic firms. The upcoming “graduation” of large emerging economies into high middle-income status actually opens up new opportunities for Africa. Confronted with the challenge of rising wages, even for unskilled workers, these successful middle-income countries will soon become uncompetitive in low-skilled, labor-intensive industries that have driven their good economic performance and will be forced to either relocate such activities in lower-wage countries, move up the value chain, or switch to more complex and capital-intensive industries where they still have comparative advantage. It is estimated for instance that China alone may have to relinquish most of its current 85 million manufacturing jobs (Lin 2011a).

African countries are well placed to seize the benefits of such a once-in-a-generation opportunity. In order to do so, they must organize themselves to fill at least some of the industrial void that China, India, Brazil and others will leave behind as they move up the industrial and technological ladder. It is therefore important to identify the policy and institutional constraints that must be removed for such an industrialization strategy to be implemented.

2 IS INDUSTRIALIZATION STILL RELEVANT IN AN INCREASINGLY DIGITIZED GLOBAL ECONOMY?

To many researchers, industrialization’s role has become marginally important in the global quest for economic prosperity. They cite as the most obvious piece of evidence the dramatic decline in employment in manufacturing as a share of total employment in the world’s most advanced economies, a phenomenon widely referred to as “deindustrialization.” This trend was first observed in the United States and Europe. Some critics saw deindustrialization as resulting from the rapid growth of North-South trade (trade between the advanced economies and the developing world) and explained that it was caused by the fast growth of labor-intensive manufacturing industries in the low-wage developing world. Viewing it as a threat to workers in the advanced economies, they branded it as a negative consequence of the globalization of markets, which generated fierce political debates in the Western world. Political leaders across the ideological spectrum seized it as the main explanation to widening income inequality in the United States and high unemployment in Europe.

These popular explanations were inaccurate. Empirical research showed that, when measured in real terms, the share of domestic expenditure on manufactured goods had been comparatively sta-

² In recent decades, innovation, technological developments and new sources of economic growth have led some economists to question whether manufacturing still matters. See Monga (2013) for a critical assessment of the arguments in that debate.

ble for decades in advanced economies. Thus, that round of deindustrialization was essentially the result of higher productivity in some capital-intensive manufacturing sectors than in services. The pattern of trade specialization among the advanced economies explained why some countries deindustrialize faster than others (Rowthorn and Ramaswamy 1997). In sum, deindustrialization was primarily a reflection of successful economic development and effective industrial upgrading strategies, and North-South trade has very little to do with it. This became even more apparent in Japan and in the successful Four Tiger economies of East Asia (Hong Kong, China, Korea, Singapore, and Taiwan Province of China), which also experienced deindustrialization.

Most recently, deindustrialization has emerged again as a concern not just for advanced economies but also for low-income countries. Rodrik (2016)'s seminal work on this topic has highlighted the changes in the relationship between industrialization (measured by employment or output shares) and incomes not just in advanced, post-industrial economies, but also in developing countries. He concludes that countries are now running out of industrialization opportunities sooner and at much lower levels of income compared to early industrializers. In other words, industry's share of employment in some developing countries seems to be peaking at a lower level than it used to do, and at an earlier point in their development. Rodrik's analysis confirms that advanced economies have lost considerable employment (especially of the low-skill type), but they performed well in terms of manufacturing output shares at constant prices. Surprisingly, Asian countries and exporters of manufactures appear to have been largely insulated from deindustrialization trends, while Latin American countries have suffered the most.

Other empirical research examining developing countries as whole has shed light on the mystery of deindustrialization. Haraguchi et al. (2017) have analyzed several decades of employment data on over 100 developing countries, going back to 1970. They explore whether the low levels of industrialization in developing countries are attributable to long-term changes in opportunities available to the sector around the globe. They find that manufacturing employment became geographically more concentrated after 1990, but no less important. Their findings show that the manufacturing sector's value added and employment contribution to world GDP and employment, respectively, have not changed significantly since 1970. The declining manufacturing value added and manufacturing em-



A happy entrepreneur © 2017. African Development Bank Group

ployment share in many developing countries has not been caused by changes in the sector's development potential but has instead resulted from a shift of manufacturing activities to a relatively small number of populous countries, thus resulting in a concentration of manufacturing activities in specific developing countries. While the average of each country's manufacturing-employment ratio has indeed declined since the early 1990s, as observed by Rodrik, the aggregate of manufacturing employment in developing countries is actually higher than in earlier decades. This counter-intuitive finding can be explained by the fact that the work force in some developing countries such as China is so large that a stagnation or even a decline in the percentage of manufacturing in the labor force does not translate into a decline in the absolute, aggregate number of workers in that sector.

Still, worries about deindustrialization and about the importance of industrialization in the modern growth and structural transformation processes have been compounded by three new factors: first, the lackluster global trade climate, which has characterized the world economy in the wake of the 2008 financial crisis.³ This

³ In the words of Davies, "world trade has lost its mojo," and global trends support his observation. From 1990 to 2008 global real GDP expanded at a 3.2 percent annual rate, while world trade volume grew at 6.0 percent. Since 2008, however, world trade has grown slightly slower than GDP, so the share of exports in GDP fell after a 25-year uptrend (Davies 2013).

new trade skepticism has led many researchers and policymakers to wonder whether today's low-income countries could benefit from the same export opportunities that allowed rapid industrialization in Asia in the 1970s-1990s—even if they could adopt the right policy frameworks and develop their manufacturing production bases. While it is indeed true that global trade grew at a lower rate than global GDP in the decade following the 2018 financial crisis, over the long term, the trade-GDP relationship is usually not a static one.

Despite the resurgence of the protectionist discourse in some advanced economies and the persistence of non-trade measures, the general, long-term trend of global trade is still a very positive one for developing countries. Moreover, the declining general trend in average tariffs around the world since World War II is unlikely to be rolled back, given the structural changes they have induced in the global production system and the enormous win-win opportunities they have created for advanced and developing economies. The best indicator of that evolution is that many goods are manufactured now in several countries at the same time. Global trade is therefore no longer a series of transactions between countries producing individual goods and services within their national boundaries and exchanging them in international markets. It is often about collaboration and partnerships, even in an intensively more competitive world. Manufacturing is increasingly a network of global supply chains in which the various production stages take place in the most cost-efficient locations—regardless of where they are in the world (Lin and Monga 2017, chapter 7).

Some researchers have observed that manufacturing is not the only driver of growth. In the words of Ghani and O'Connell (2014), Enache et al. (2016), there is an ongoing Third Industrial Revolution led by services, which may now contribute substantially to output growth, productivity growth, and job growth in low-income countries. Services are invalidating some long-held tenets of economic development: for centuries, service trade was limited because it required proximity and face-to-face interaction between the buyer and the seller. However, this is no longer the case, as technology and innovation allow services to be produced and traded just like manufactured goods. Moreover, the cost of trading services that can be digitized has fallen dramatically, as services do not have to confront customs and other logistical barriers. And service-led growth is also greener and more gender-friendly. These observations have led Ghani and O'Connell to suggest that the services sector, branded as a "growth escalator for low-income countries," be given priority in the design of structural transformation strategies. They conclude: "Unlike in the manufacturing sector, where developing countries al-

ready have a large market share, making it difficult for new entrants to become large-scale exporters, services appear to be steadily expanding, with catch-up opportunities continuing to rise and entry possibilities for all. A service-led growth can be sustained because the current globalization of services is only the tip of the iceberg, and services are the largest sector in the world, accounting for more than 70 percent of global output" (Ghani and O'Connell 2014).

Today's global economy certainly offers infinite opportunities for growth and transformation in the services sector but not to countries at all levels of development. Therefore, one should be careful not to draw sweeping policy recommendations from the fact that an increasingly large services sector is driving global growth. First, there is a semantic issue to be addressed: manufacturing no longer means the type of old, capital-intensive industries that spurred the First Industrial Revolution in the eighteenth and nineteenth centuries. With the advent of the Second Industrial Revolution, manufacturing has become a continuum of activities that are interlinked. Schwieters and Moritz noted: "One key indicator is that conventional boundaries between industries are eroding. It's getting harder to tell the difference between, say, a telecommunications company and an entertainment producer, or between a retail bank and a retail store. The relationships among suppliers, producers, and consumers are also blurring, more rapidly than many business decision makers are prepared for" (2017). The definitions of "agriculture," "manufacturing," and "services," should therefore evolve to reflect the constantly changing boundaries of these sectors. In its current meaning, manufacturing should be understood in its broadest sense as all trade based on the fabrication, processing, or preparation of all kinds of products from raw materials and commodities to chemicals, textiles, machines, equipment, and even modern services and virtual goods.

Second, even in developing countries where there has been a boom in the services sector without industrialization, a lot of these services are low-productivity, subsistence, and even informal activities that may help households escape poverty, but are not sustainable sources of growth. The type of high-productivity services that offer long-term growth prospects to nations (in sectors such as informational technology, or banking and finance) are skill-intensive. Yet, by definition, low-income countries have weak skills bases. That is certainly the case in most African and South Asian countries where the demographic structure and limited fiscal base do not allow for the rapid building of the kind of human capital necessary to sustain economic transformations driven by high-productivity modern services. Even developing countries like India, Sri Lanka, Kenya, Cameroon, or Egypt, where substantial amounts of public funding



South Africa. 2015. Xina Solar Plant © 2017. African Development Bank Group

have been devoted to the creation of strong education systems too often end up exporting much of their skilled labor. Consistent with the basic rationale for structural transformation, which is to constantly move labor and capital into higher-productivity sectors, it is logical that advances in the modern service sector, rather than in traditional manufacturing, drives the growth of living standards in the advanced economies in the future and in the middle-income countries that successfully manage their industrial upgrading process. However, for low-income countries, low-skilled and labor-intensive industries still offer sizeable growth opportunities—especially with the upcoming “graduation” of large middle-income countries like China or Indonesia, which is freeing up substantial quantities of industrial employment (Lin, 2011a).

Finally, there is the perceived threat of automation on industrialization. Improvements in the design of robots, and their increasing use in many industries around the world, have made economists wonder whether the long-held prescriptions for structural transformation are becoming obsolete. If sophisticated and smart robots,

not people, can fill the factories and therefore lower production costs, wouldn't that invalidate Simon Kuznets' insight that modern economic growth requires moving resources out of agriculture into industry, then out of industry into services?

The question of whether robots hamper industrialization's central development role is indeed important. However, the potential adverse employment and income effects of robots are being overestimated—most commentators neglect to consider that what is technically feasible is not always also economically profitable. For instance, it would be technically possible (if not necessarily economically sensible) to automate about two-thirds of manufacturing employment in countries like India, Indonesia or Thailand (Leke et. al., 2010). But the economic and social returns for doing it in the decades ahead are unclear, at best. The countries currently most exposed to robot-based automation are those with a large and well-paying manufacturing sector (UNCTAD 2017). While routine tasks in well-paying manufacturing and service jobs are being replaced by robots, low-wage manufacturing jobs in areas such as

clothing factories are left largely unaffected by automation (UNCTAD 2017). So far, robotization has had only a small effect on most developing countries, where mechanization continues to be the predominant form of automation. Despite the hype surrounding the potential of robot-based automation, today the use of industrial robots globally remains quite small and amounts to less than 2 million units.⁴ Industrial robots are concentrated in the automotive, electrical and electronics industries, and in a small number of countries.⁵

Deindustrialization and automation need not to be viewed as worrisome phenomena. The appropriate response to the perceived or real threats that they pose is for developing countries to implement digital industrial policies to ensure that robotics supports—rather than threatens— inclusive development. This will require that countries at various levels of development constantly design and implement proactive upgrading strategies that are suited to their evolving endowments and comparative advantages.

3 WHAT EXACTLY IS INDUSTRIAL POLICY AND CAN A GOVERNMENT AVOID IT?

Industrial policies are government policies directed at affecting the economic structure or the shape of the economy (including the sectoral allocation of resources and the choices of technology within any given sector). Arguably, the East Asia Miracle—one of the most remarkable episodes of growth in history—was based largely on government interventions into the market economy, including extensive use of industrial policies (World Bank 1993; Lin 2011b).

Today, the relevance and pertinence of industrial policies are acknowledged by mainstream economists and political leaders from all sides of the ideological spectrum. All governments in the world are constantly engaged in various forms of industrial policies—they take actions that favor certain industries more than others and therefore shape the sector allocation of the economy. In all countries, some industries, sectors, and even firms are favored within the legal framework and often heavily subsidized, often in non-transparent ways. As noted by Stiglitz et al., “market forces do not exist in a vacuum, and that they are all shaped by laws, rules, and regulations, each of which is never truly ‘neutral,’ as it explicitly or implicitly favors or discourages particular industries, sectors, firms, and social players. All governments really do have an industrial policy.

The only difference is between those who construct their industrial policy consciously and those who let it be shaped by others, typically by special interests, who vie with each other for hidden and open subsidies, for rules and regulations that favor them, usually at the expense of others” Stiglitz et. al (2013).

In the **United States**, the government has funded the creation of a manufacturing innovation institute in Youngstown, Ohio. They have announced the launch of “manufacturing hubs,” where businesses will partner with the Departments of Defense and Energy to turn regions left behind by globalization into global centers of high-tech jobs, and the government has asked Congress to “help create a network of fifteen of these hubs and guarantee that the next revolution in manufacturing is Made in America.” Indeed, the United States, for more than 150 years, has benefited from active industrial policies, from the development of the agricultural sector (the dominant sector in the economy in the mid-nineteenth century), to the development of telecommunications (from the development of the first telegraph line in the first half of the nineteenth century), to the development of the Internet (one of the central areas of growth in the twenty-first century).

Very often, industrial policy is actively carried out in the most unexpected economic sectors—those where the private sector is supposed to be the only major player. A case in point is that of the American banking sector: the Federal Reserve (a branch of the government) lends money to banks at 1 percent interest rate, which is then used by these banks to buy Treasury bills (from the same government) at, say, 4 percent (that represents about \$30 billion in subsidies a year, more than any developing country governments will ever grant to one industry).

Bankruptcy laws that put derivatives first in line in the event of bankruptcy effectively give preference to the financial sector. Most countries’ tax codes are riddled with tax expenditures that provide hidden subsidies to particular industries. But even in the absence of such “special” provisions, the design of depreciation allowances will affect industries with different capital life spans differently. Budget policies also inevitably have impacts on industrial structure: where governments locate roads and ports affects different industries and firms differently. In short, one cannot escape thinking about the differential impacts of different policies on different sectors.

⁴ Of the 1.63 million industrial robots in operation worldwide in 2015, only 1,580 were in textiles, apparel and leather. Of all the industrial robots shipped that year, a third ended up in middle-income countries (International Federation of Robotics).

⁵ Almost half of operational industrial robots are in Germany, Japan and the United States of America, but China has quadrupled its robot stock since 2010, and the Republic of Korea has the highest number of robots per worker globally (UNCTAD 2017).

In the **United Kingdom**, Conservative Prime Minister David Cameron promised “to have a proper industrial strategy to get behind the growth engines of the future.”

In the **European Union (EU)**, almost all governments are reassessing their industrial strategies, trying to learn from the successful experiences of Finland or Germany. Specific sectors are identified for support (motor vehicles and transport equipment industries, energy supply industries, chemicals, agro-food, etc.) and sector-specific initiatives recommended to promote them. An entire department at the EU Commission is devoting much financial and human resources to design and help implement industrial policies across the Eurozone.

4 WHAT ARE THE THEORETICAL FOUNDATIONS FOR INDUSTRIAL POLICY?

Despite the debates and controversies over the proper scope, instruments, and conditions of effectiveness of industrial policy, there is wide consensus among economists on its theoretical foundations. Many researchers and policymakers accept that countries should design and implement industrial policy: to correct market failures (situations where markets by themselves do not lead to efficient, or desirable, resource allocations), or even to correct other government failures, where other, harder to alter, government policies “distort” resource allocations.

In fact, the legitimacy of government intervention to actively promote certain industries has been established in economics since Alexander Hamilton, and Adam Smith, and well described by List et al. (1856). Following Marshall (1920), who pointed out the important role of externalities, and the work of Arrow and Debreu that laid out the highly restrictive conditions under which markets resulted in (Pareto) efficient outcomes, neoclassical theorists eventually acknowledged that markets often do not work as they are supposed to. But, just as macroeconomics has evolved in two main directions in recent decades (the neoclassical and neo-Keynesian paths), two broad groups of theorists have emphasized very different types of rationales for industrial policy too.

Neoclassical theory acknowledges the need for government intervention only in situations of market failures—when market mechanisms let alone do not allocate resources efficiently. These situations arise from three major sources: the first and most widely accepted

case of market failure arises from positive externalities, generally defined as opportunities that are generated by investment or risk taken by one agent and yet benefiting others in the economy. The typical case is that of research and development (R&D), which is costly to pioneer firms that pay for it and sometimes generates free new knowledge for other firms. In a free market system, risk-taking companies are not systematically rewarded for producing technological externalities and generating such social benefits. Therefore, R&D activity tends to be lower than that which would be optimal from the society’s perspective. For pioneer firms, the cost of scientific research and technological discovery can be high. The difficulties in appropriating the knowledge they create (typically after incurring substantial sunk costs) lower their incentives for research—unless the government values the potential social benefits of new knowledge and steps in to change the incentives by subsidizing R&D, by redefining property rights in a way that limit information and transaction costs, or by granting firms various forms of support and protection (Arrow 1962).⁶

A second case of market failure stems from Marshallian externalities exhibited by some sectors or industries, which give rise to geographic agglomeration. These particular types of externalities can arise through localized industry-level knowledge spillovers, and input-output linkages together with transportation costs—to ensure that the externalities remain local—and labor pooling (Marshall 1920; Krugman 1991; Harrison and Rodríguez-Clare 2009). In some variations they can lead to monopolies or oligopolies and thus market power. In industries that are characterized by high entry barriers or high fixed costs (and thus, economies of scale), pioneer firms can enjoy the protection of first-mover advantages that prevent potential competitors entering the market. Government intervention may then be required to allow other entrants and limit the rent capture by one firm, which is always detrimental to consumers (Brander and Spencer 1986).

Another rationale for public intervention is the need to address issues of coordination. Economic growth is a process of continuous industrial and technological upgrading that requires evolving institutions. As a country climbs up the industrial and technological ladder, many economic, institutional, and social changes take place: the technology used by its firms becomes increasingly sophisticated, physical and human capital requirements increase, as well as

⁶ Coase (1937) showed in his well-known theorem that when there is a conflict of property rights, the involved parties can bargain or negotiate terms that are more beneficial to both parties than the outcome of any assigned property rights. The theorem also asserts that in order for this to occur, bargaining must be costless; if there are costs associated with bargaining (such as meetings or enforcement), it will affect the outcome. Externalities may be managed by private agents to avoid resulting in an inefficient allocation of resources if they are “internalized” in situations where there are no transaction costs and when property rights are well defined.

the scale of production and the size of markets. Market transactions are also more complex, as they involve agents from various parts of the economy. A flexible and smooth industrial and technological upgrading process therefore requires simultaneous improvements in educational, financial, and legal institutions, and in physical infrastructure so that firms in the newly upgraded industries can produce sufficient amounts to reach economies of scale and become the lowest-cost producers. Clearly, individual firms or households cannot internalize all these changes cost-effectively, and spontaneous coordination among many private agents to meet these new challenges is often impossible. Changes in physical infrastructure, institutions, and regulations require collective action, or at least coordination, between the providers of infrastructure services and industrial firms. For this reason, it falls to the government either to introduce such changes itself or to coordinate them proactively.

A fourth case of market failure emerges from information asymmetries and incomplete markets—that is, in situations where goods or services demanded are not available even when consumers are ready to pay a higher price. Furthermore, consumers cannot assess the quality of goods on offer because the markets are characterized by asymmetric information, which can lead to adverse selection (when quality cannot be evaluated on individual goods but only on an average for comparable goods) and moral hazard (which occurs when one party to a transaction does not enter into a contract in good faith, provides misleading information about the value of its assets, or has an incentive to take unusual risks). In such economic situations, firms do not have equal access to information, and competition can be severely restricted. When some businesses develop strategies that create imperfections in market conditions, the government has two options to intervene: either by formulating a strong competition policy in order to restore a level playing field, or by adopting a strategic industrial policy through which it plays an active role in encouraging non-opportunistic behavior (Cohen 2006).

Theoretical justifications of industrial policy are also offered by economists who do not belong to the neoclassical tradition. Evolutionary theorists for instance stress the importance of innovation and technological change in the growth process. Because national economies are constantly evolving, static levels of R&D and innovation are less revealing determinants of performance than the institutional framework in place to ensure constant production of

knowledge and its diffusion among private agents. They posit that governments must play an important role in building the capacity of domestic institutions to anticipate major economic trends and cope with systemic change (Nelson 1995).

Other theorists have focused on incentives for cooperation between businesses in sectors of industrial innovation, and in particular the need to pool financial resources and complementary competences for research in areas where strong cooperation is required as new technologies become more complex and more expensive. Since firms' cooperation in R&D reduces costs, saves them time, and spreads the risk of failure, the case can be made for governments to encourage information transfer and collaboration among companies. A well-known mechanism for achieving that objective is a financial incentive for cooperation such as the granting of public funding contingent on collaboration between firms. Government interventions that help disseminate new knowledge or share existing information can increase the likelihood of producing more-efficient technical solutions by firms.⁷ Cooperative research among private firms but sponsored by governments can also lead to positive information sharing and innovation, which are crucial for a knowledge-based economy (Spence 1984; Katz 1986).

These many theoretical justifications for industrial policy have not deterred some conservative economists who argue for a “limited role” for government intervention. Even when these skeptics acknowledge the existence of extensive market failures, they express little confidence that state intervention would succeed in improving matters. They have typically cited examples of government interventions to correct market failures that indeed led to economic distortions, especially in developing countries. Against market failures they set what they argue were pervasive government failures, especially in developing countries. Some argue that these problems have been especially severe in industrial policies.

The 2008-2009 global financial and economic crisis known as the Great Recession has forced conservative/neoclassical researchers and policymakers to confront the reality that market forces alone generally do not lead to (constrained) Pareto-efficient outcomes (Stiglitz et al. 2013). Building on some of its earlier work on the economics of information, Stiglitz (2001) has highlighted other market failures that government intervention should and could address.

⁷ A case in point is that of SEMATECH, a U.S. association of semiconductor manufacturing firms that cooperate pre-competitively in key areas of their value chain. Similar models of cooperation among competing firms in strategic industries have been implemented in Japan under the leadership of the Ministry of International Trade and Industry, which oversees the agreements, and guarantees that each company acts fairly (Cohen 2006). For a robust analysis of the need for industrial policy and well-documented review of major important cases of state interventions, see Mazzucato (2013).

For instance, it is now widely accepted that the government should try to do something about negative externalities (from pollution or from excessive risk-taking in the financial sector). It has also become increasingly clear that government interventions are needed to ensure proper coordination of risky investment decisions that no single firm or private agent alone can pursue efficiently. So too, the government has played a constructive role in promoting industries and activities that give rise to positive externalities—most notably those associated with learning and research.

Many important national and global policy objectives (equality of opportunity for all citizens, financial stability and inclusion, environmental protection and pollution control, etc.) are simply often not reflected in market prices and not achieved by markets on their own. In addition to traditional justification for industrial policies—dealing with externalities and coordination issues—economists and policymakers now acknowledge the need to foster learning at the level of each economic agent and throughout society, and the ultimate responsibility that the state must bear in that crucial process. Around the world, there is a broad consensus that efforts to control environmental externalities have been successful, by and large, and have improved collective well-being—by an amount that far exceeds any costs that may have been imposed. Cities where the air

was not breathable have become livable again; water that was badly polluted has become drinkable and suitable for swimming. Discussions of industrial policies that traditionally focused on how such policies can affect the long-run rate of growth have now moved to how societies can achieve other social objectives to which such policies may be directed. Such objectives include improving the distribution of income among social groups (especially in countries where there has been a historical legacy of institutionalized discrimination), increasing employment, protecting the environment, and ensuring sustainability.

Robert Solow's work shed light on how most increases in standard of living are related to the acquisition of knowledge, to "learning." Most increases in per capita income arise from advances in technology—about 70 percent of growth comes from sources other than factor accumulation. In developing countries, a substantial part of growth arises from closing the technology (or knowledge) gap between themselves and those at the frontier. And within any country, there is enormous scope for productivity improvement simply by closing the gap between best practices and average practices. If improvements in standards of living mainly come from diffusion of knowledge, learning strategies must be at the heart of the development strategies.



Morocco PADESFI (Financial sector development support program) 2014 © 2017. African Development Bank Group

It follows that understanding how economies best learn—how economies can best be organized to increase the production and dissemination of productivity-enhancing knowledge—should be a central part of the study of development and growth. But markets on their own fail to “maximize” learning. They ignore important knowledge spillovers. Sectors where knowledge is important tend to be imperfectly competitive, with the result that output is restrained. In fact, the production of knowledge is often a joint product with the production of goods, which means that the production of goods themselves will not in general be (intertemporally) efficient.

5 CAN “HORIZONTAL” BE SEPARATED FROM “VERTICAL” INDUSTRIAL POLICIES?

Even economists who oppose sector industrial policy (the so-called “vertical” policies to support specific industries) acknowledge the need for broad, neutral, “horizontal” industrial policy (one that does not target specific industries). Yet the lines between the two could be blurry. Everything governments do or choose not to do benefits or can be captured by vested interests. A particular exchange rate policy could be presented as “neutral” and “broad-based”. Yet, we know that some sectors, industries, social groups, and even regions are always favored or penalized by any stance on exchange rate. Even when there is no change, some benefit while others lose.

Likewise, infrastructure development is often presented as a suitable tool of economic policy because of its perceived “neutrality.” Yet there is nothing neutral about the choice of infrastructure that a country needs at any given time, or where and when it should be built. These decisions always involve some political judgment about priorities, and are therefore equivalent to industrial policies. The same is true for education, which is often mistakenly presented as “neutral.” Therefore, the question is not *whether* any government should engage in industrial policy but *how* to do it right.

Leaving economic development to the market is taking a bet on what I call the painful economics of chance: different industries require different types of infrastructure. Since low-income country governments do not have the financial resources to accommodate all industries at once, it is best to work with the private sector to identify the industries where the economy has comparative advantage, and focus on providing specific infrastructure and transparent, limited, incentives that would allow these industries to grow.

One simply has to look at the list of recent success stories in African countries to understand the role that industrial policies have already been playing: textiles in Mauritius, apparel in Lesotho, cotton in Burkina Faso, cut flowers in Ethiopia, mango in Mali, and gorilla tourism in Rwanda all required that governments provide *different* types of infrastructure. The refrigeration facilities needed at the airport and regular flights to ship Ethiopia’s cut flowers to the auctions in Europe are obviously quite different from the improvements required at the port facilities for textile exports in Mauritius. Similarly, the type of infrastructure needed for the garment industry in Lesotho is distinct from the one needed for mango production and export in Mali or for attracting gorilla tourism in Rwanda. Because fiscal resources and implementation capacity are limited, the government in each of those countries had to prioritize and decide which particular infrastructure they should improve or where to optimally locate the public services to make those success stories happen.

Harrison and Rodríguez-Clare (2009) have suggested that government decisions aiming at tilting incentives in favor some of particular groups of investors, which means abandoning policy neutrality, can be considered “industrial policies”⁸. The presence of externalities is then viewed as the main theoretical justification for deviating from policy neutrality. That definition is broadly consistent with Cohen’s, who asserts that “industrial policy in the strict sense is a sectoral policy; it seeks to promote sectors where intervention should take place for reasons of national independence, technological autonomy, failure of private initiative, decline in traditional activities, and geographical or political balance” (2006, p. 85). That sector- or industry-specific approach (often labeled as “vertical”) is defined in contrast to an economy-wide (“horizontal”) approach to policymaking, which consists of general business environment policies that have an indirect impact on industry—including macroeconomic and social policies, as well as capital equipment and national defense policies.

In practice, however, the delineation between policy areas that are affected exclusively by a particular set of government measures is difficult to establish, as rules always have indirect, unintended, and sometimes even unobservable effects. That may explain why some authors define “industrial policy” as any form of selective intervention, not just that which favors manufacturing. The term then refers to all “policies for economic restructuring [...] in favor of more dynamic activities generally, regardless of whether those are located

⁸ However, they note: “Policy neutrality does not necessarily mean free trade, or a neutral stance regarding taxation of multinational corporations, or even a common tax structure for all industries. Both optimal tax theory and practical fiscal considerations imply that countries (especially poor ones) will often want to rely on tariffs as a source of revenue or set different tax rates across industries” (Harrison and Rodríguez-Clare 2009).

within industry or manufacturing per se” (Rodrik 2004, p. 2). Because there is no evidence that the types of market failures that call for industrial policy are located predominantly in industry, Rodrik suggests specific illustrations of industrial policies that concern non-traditional activities in sectors such as agriculture or services. That broad definition of industrial policy is then used to cover functional and selective and market-based as well as direct policy measures.

Still, many researchers continue to advocate a minimalist approach to industrial policy. Weiss for instance argues that broadening the term too far makes it not very useful conceptually. He also suggests that it focuses exclusively on manufacturing industry, which has a special role in growth due to its greater scope for generating high levels of and growth in productivity (at least at relatively early stages of development) and externalities. In that sense, industrial policy refers to “policy interventions designed to affect the allocation of resources in favor of industry (principally manufacturing) as distinct other sectors. Such interventions may also affect resource allocation within industry in favor of either particular branches or sub-sectors or particular firms (so they may be ‘selective’ rather than ‘functional’). Interventions can involve either the price mechanism or direct controls and be focused on export as well as the domestic market. Industrial policy in this definition is thus much wider than import-substitution trade policies with which it is often associated” (2011, p. 1).

Such semantic controversies do not really solve the policy puzzles faced by policymakers around the world. While the rationale for narrowing the definition and scope of industrial policy may be useful from a purely conceptual standpoint, it is difficult to implement in practice, as most state interventions cannot be restricted neatly to specific policy areas. Moreover, the role of all governments is to design and implement a range of policies to foster business creation in some locations, support specific sectors of the economy, encourage exports, attract foreign direct investment, promote innovation, all of which amount to favoring some industries over others. As Nester observes, “every nation has industrial policy whether they are comprehensive or fragmented, or whether officials admit the practice or not.” His research shows that “every major industry in America is deeply involved with and dependent on government. The competitive position of every American firm is affected by government policy. No sharp distinction can validly be drawn between private and public sectors within this or any other industrialized country; the economic effects of public policies and corporate decisions are completely intertwined” (1997). These observations about a country often presented as the most successful free market economy in history invalidate the semantic

controversies and the proposition that industrial policy is necessarily a misguided development strategy.

6 DO AFRICAN COUNTRIES HAVE THE CAPACITY TO DESIGN AND IMPLEMENT INDUSTRIAL POLICY?

Skepticism about industrial policy has increasingly shifted from its theoretical justification toward its applicability in the context of developing countries where administrative capacity (especially for policy design and implementation) is perceived as weak. Various factors—pathological politics and pervasive corruption—are said to make industrial policy ineffective or even counterproductive for African countries. Skeptics also provide an impressive list of knowledge requirements about targeted industries that government officials would need to know in order to design a successful industrial policy. They question the capability of governments in poor countries to meet those requirements.

These arguments deserve serious attention. First, all countries at the low-income level tend to lack high bureaucratic capacity by definition. But market failures also tend to be more pervasive and there is often a shortage of private-sector entrepreneurship. Hence, in many cases, state-led development (often employing market mechanisms) has been shown to be the most effective development strategy. The point, as we have previously noted, is that these concerns should affect the form of industrial policy, not whether the government should undertake industrial policy.

On the other hand, the argument that the knowledge requirements for the effective design of industrial policies are beyond the capacities of developing countries is not persuasive. Some of the so-called knowledge requirements identified for industrial policy are likely to be more relevant for more-advanced industries in high-income countries. For industries with low technical content, the knowledge requirements are markedly more limited. Moreover, instead of analyzing the technical nature of various industries, government officials can rely on the advantage of backwardness and observe what the dynamically growing countries with similar endowment structures are already doing or have done in the past.

By the same token, broad-based measures, e.g. encouraging the industrial sector broadly, do not necessitate the government making fine-tuned judgments. As Greenwald and Stiglitz (2013) argue, such policies are desirable so long as learning elasticities and knowledge spillovers are greater in those sectors. Industrial policies can “tilt” the playing field toward sectors or technologies with positive spillovers/externalities and away from those with negative spillovers/externalities.



Women advertising manufactured rice in Egypt Samy Boulos 2015 © 2017. African Development Bank Group

Central to creating a modern economy is creating a learning economy and society and government intervention can play an important role in doing this. The difficulties of implementing any type of public policy anywhere in the world are well known. Critics point to the scope for rent seeking. Avoiding rent seeking is but one of the challenges facing the effective implementation of industrial policy. In some cases, governments have been tempted to ignore economic “rationality” and have pursued more sophisticated sectors in their zeal to emulate advanced countries; sometimes they have extended even successful policies well beyond their effective time span.

These concerns are legitimate but apply not only to whatever is labeled “industrial policy.” The potential for abuse exists for any public policy: many governments around the world have misused monetary and financial regulatory policy, infrastructure policy, or education policy. But few would argue that as a result, governments should eschew the use of monetary and financial regulatory policy, infrastructure policy, or education policy. The contrast between attitudes toward monetary and industrial policies is especially striking: while the fact that so many governments (including that of the United States) have mismanaged monetary policy is generally not

viewed as grounds for abandoning monetary policy, the fact that industrial policies have sometimes been mismanaged has often been used as an argument against such policies. And there is ample evidence of “capture” of the U.S. Federal Reserve by the financial market in the years before the crisis (and some critics say even after). Moreover, what some thought were mistaken industrial policies—such as those undertaken by Korea in the late 1960s and 1970s—proved enormously successful, propelling that country forward, to enable it to join the OECD, the club of the advanced industrial countries.

Pervasive governance issues are often offered as reasons not to engage in industrial policy. But the countries that successfully engaged in industrial policies in recent decades had, at the time they embarked on their development strategies, typically had far-from-perfect governance structures (and, as the crisis illustrated, even the advanced countries have governance structures that are far from ideal).

While political economy problems need to be taken seriously, one should not let the best be the enemy of the good. To wait for the perfect African state to emerge before industrial policy can be im-

plemented would imply never getting anything done. In the real world, successful countries are the ones that have managed to find “good enough” solutions to their political economy problems and implemented these sound policies. Deficiencies in governance should affect the type of industrial policies and the manner in which they are implemented, not the use of industrial policies themselves.

Moreover, the decades of successes and failures in industrial policies have provided multiple lessons on how to design effective industrial policies. For instance, Lin and Monga (2013) argue that the traditional type of industrial development strategies pursued by developing countries in the 1950s and 1960s has often encouraged firms to enter industries that were inconsistent with their comparative advantage (even broadly defined to include “dynamic” comparative advantage). Firms in these industries have not been viable in an open, competitive market. Their survival has depended on heavy government protection, large subsidies, and direct resource allocations through measures such as monopoly rent, high tariffs, quota restrictions, and subsidized credits. The large rents embedded in those measures created many distortions and easily became the targets of political capture (Lin 2012).

7 WHAT INSTITUTIONS CAN FOSTER AFRICAN INDUSTRIALIZATION IN A WORLD OF GLOBAL VALUE CHAINS?

Throughout history, countries have developed various institutions to foster industrialization. Among the most popular are government agencies specifically devoted to attracting investment to a country, state, region, or city, or to promoting exports. Almost all African countries have set them up, with various degrees of success. In today’s global economy, where trade is increasingly dominated by GVCs, two other important institutions deserve special mention: the special economic zones (SEZs) and the development banks. African policymakers should strive to make them work effectively.

Both general SEZs and specialized ones in particular (industrial and technology parks)⁹ are of particular importance. They have been used effectively in advanced economies such as Australia, Denmark, Sweden, Germany, Switzerland, Ireland, Japan, the United Kingdom, and the United States, to encourage the development of clusters

and to circumvent the well-known problems with the general business environment. SEZs have also been used effectively by some latecomers in the development process such as Ireland, Korea, Mauritius, Taiwan-China, or China, to emulate leader-countries and even catch up with them in the race to economic prosperity.

The well-known rationale for SEZs in developing countries is to provide special policy incentives and infrastructure in a circumscribed geographic location to firms that can attract foreign direct investment, create jobs, develop and diversify exports (even when economy-wide business environment problems and protective barriers are not yet resolved) and foreign exchange earnings, and serve as “experimental laboratories” for new pricing, labor, financial or labor policies. The ultimate expectation is that the knowledge spillovers of these experiments eventually translate into private-sector development, sustained growth, productivity increases, and other financial and economic benefits for the entire economy. Policy incentives in SEZs typically include import and export duty exemptions, streamlined customs and administrative controls and procedures, facilitated access to foreign exchange and relatively low-income tax rates. Export-oriented SEZs are generally intended to “convey ‘free trade status’ to export manufacturers, enabling them to compete in global markets and counterbalance the anti-export bias of trade policies” (FIAS 2008, p. 12).

Unfortunately, most countries that have created SEZs have not gained the expected benefits. African countries in particular have faced two main constraints that have prevented private-sector development to take place through them: high factor costs and high transaction costs (often compounded by political capture and rent seeking). The good news is that careful analysis of previous SEZ experiences and lessons from economic history and economic theory can shed light on the reasons for failure. Taking these lessons into account, African policymakers can rethink the way they design and operate SEZs and derive big gains from them.

High factor costs can be addressed only if economic development strategies are fully consistent with a country’s comparative advantage so that the factor which is in relative abundance is used extensively. This requires that the industries selected and attracted into SEZs are primarily those that make good use of low-skill labor, are

9 This section draws on Monga (2013b).

10 The 1973 International Convention on the Harmonization and Simplification of Customs defines a free zone as a specific place in a country “where any goods introduced are generally regarded, insofar as import duties and taxes are concerned, as being outside the customs territory [...] and not subject to the usual customs control” (Annex D). Free zones have existed in various parts of the world for centuries, most notably in Gibraltar (1704) and Hong Kong (1848). Modern SEZs typically are located in a geographically delimited area (often secured), and host firms that are eligible for benefits, a separate customs area (duty free benefits) with streamlined procedures, and single management structure. Industrial parks can be broadly defined as a category of SEZ that provide specialized services to specific industries.

competitive, and quickly establish effective backward linkages with the rest of the domestic economy.¹¹ The removal of the second constraint—high transaction costs—necessitates the development of large numbers of firms in industries where economies of scale, intra-industry knowledge spillovers, “forward and backward” linkages,¹² good supply chain/logistics, and other agglomeration effects can be achieved. In other words, the development of cluster-based industrial parks (CBIPs) in particular can yield big economic and social payoffs to African and other developing countries, assuming all the other constraints, such as those that led to high factor costs, have been removed.

The reasons for that can be found in both economic theory and empirical analyses. Clusters or industrial agglomeration arise in situations where there are industry-specific and local externalities (the so-called Marshallian externalities), which may justify policy interventions (Rodríguez-Clare 2005; Harrison and Rodríguez-Clare 2010). Empirical studies of economic diversification also provide important insights for the development of CBIPs. Recent research has shown that poor economies with more diversified economies tend to have higher levels of income per capita. Sectoral *diversification* in early stages of development is generally accompanied by geo-

graphic *agglomeration*. In the words of Imbs and Wacziarg (2003), the range of industries expands and factors are allocated increasingly equally across sectors. At the same time, new sectors tend to localize in specific regions.

The location of production is of particular importance as it allows for (or impedes) agglomeration externalities, a key element for improving productivity and exploiting economies of scale (World Bank 2009). Manufacturing in particular can reap economies of scale through geographic concentration. “This is most obvious at the plant level: the very idea of a plant is to bring machinery and workers together in a single location. However, it also applies to the location of firms engaged in the same activity. By clustering together, similar firms reduce each other’s costs.” (UNIDO 2009, p. xv). Clustering also helps firms lower their transaction costs and expand.

The renewed enthusiasm about SEZs and the potential of CBIPs should not preclude the need to understand why most attempts in Sub-Saharan Africa have failed to deliver their promises. In fact, several African countries such as Senegal and Liberia launched free zones in the early 1970s, with little success. The direct benefits expected from export growth and export diversification, employ-

11 That did not happen in the previous rounds of industrial and SEZs policies for several reasons discussed earlier in this paper.

12 Backward linkages can be defined as the various channels through which money, goods, services, and information flow between a firm and its suppliers, and create a network of interdependence and mutually beneficial business opportunities. Forward linkages are similar connections between a firm and its customers.



Togo, 2012. Lome Container Port © 2017. African Development Bank Group

ment and income generation, foreign direct investment, foreign exchange and government earnings generally appear to have been negligible. The indirect benefits (job creation, technology transfer, knowledge spillovers, managerial know-how, skills upgrading, etc.), which are more difficult to assess because of their dynamic nature, have generally also been rather limited (Farole 2011).

In most countries, the benefit-cost ratio for setting up and running SEZs has been disappointing: personal income tax on employment, permit fees and service charges, sale and rental fees on public land to developers, import duties and taxes on products from the zones sold to the domestic customs territories, concession fees for facilities such as ports or power plants, and corporate income tax (when assessed) has totaled only negligible amounts. In the meantime, import duties and charges lost from the smuggling opportunities created by SEZs, tax revenue forgone from firms relocating from the domestic customs territory into the zones, public investment for (often untargeted) infrastructure and recurrent expenditures (mainly the wage bill of public sector workers needed to run and regulate the zones) often represented substantial costs to governments.

Looking in retrospect at the reasons for their generally weak performance, one can point to a variety of factors ranging from poor institutional design and management of the initial concept to ineffective macroeconomic and microeconomic policies, which have often created major distortions and led to failure. The objectives of these zones have often not been clearly articulated or unrealistic, and the policy tools for achieving them inconsistent.

The industries attracted to the zones sometimes defied the country's comparative advantage and have therefore not been viable without a strong set of protection policies. In most instances, policymakers have either identified those industries that they wanted to favor for personal reasons, or they did not actively attempt to identify which particular industries may be most suited to their country's endowment structure (i.e., labor-intensive industries). They have assumed that any foreign firm that would be willing to join the zone would create some jobs, which would be better than nothing... One consequence of the absence of identification strategies has been the random mushrooming of small single firms from very different types of industries. Naturally, governments could not provide them with the industry-specific infrastructure support they needed.

Many zones were exclusively developed, regulated and operated by governments or public entities. Beyond the obvious issues of expertise and capacity, that type of institutional arrangement has

often led to conflict-of-interest situations, with regulatory agencies also engaged in zone development activity, especially when public zones compete with private firms outside the zone.

Policies and privileges in the zone have been severely restricted, at least in theory, with access to a generous set of privileges often controlled by a small group of civil servants. The criteria for selecting qualifying firms have not always been transparent. When they were, they have seemed too restrictive, as firms typically have had to export at least 80 percent of their production. Merchandise that could be introduced duty- and tax-free by registered enterprises or individuals were restricted to direct inputs for manufacturing. Such regulations were often the source of rents.

The choice of the location has not always been optimal. While some zones were built in port cities that were already growth poles, or near transport hubs, others were created as isolated geographic enclaves or in remote areas, not on the basis of an economic rationale but as a way of appeasing political constituencies. This has increased transaction and production costs for the few firms willing to build factories there. Such problems are likely to arise again if appropriate precautions as discussed below are not taken in the design of new zones.

Reducing transaction costs has not been part of the strategic focus. Because of the randomness in industry selection and the limited government financial resources, even basic infrastructure has not been made available in many of these zones. Governments have not proactively played their indispensable facilitating roles: they were not providing some basic industry-specific infrastructure and often waited (in vain) for qualifying firms to finance investment in electricity, water, or telecommunication within the zone. They did not coordinate the design and implementation of the investment needed and used collectively by firms in their industries (storage facilities for example). Again, in retrospect, it may have been beneficial to public finance that governments did not spend even more money financing sub-optimal and unprofitable infrastructure.

As shown in investment climate surveys carried out in Africa, government officials running SEZs also did not realize that successful integration into the world economy increasingly requires the realization of behind-border measures that fall under the heading of trade facilitation. They failed to alleviate the burden of red tape and provide the type of services such as customs and port efficiency. In some countries, it often took more than a year for a foreign firm to obtain necessary permits to operate in a SEZ. They also had to

deal with heavy and complex bureaucratic rules and procedures, a very high cost of infrastructure (communications, energy, water), and constraining labor regulations. In addition, they had to agree to unrealistic job-creation goals, and high requirements for initial investment. In many African countries, qualifying firms that managed to join SEZs still had serious difficulties accessing foreign exchange and other financial services.

Because of their poor design, ineffective management and misguided policies, most SEZs have not attracted enough firms in competitive industries. Moreover, these firms did not generate enough backward linkages with local suppliers and sub-contracting business relationships with other local enterprises. Too often, local firms either had no interest in supplying SEZ-based firms or they failed to meet world market standards for quality, price, and delivery times. SEZ-based firms themselves have tended to use domestic factors and inputs only in limited extent and condemned themselves to remain small enclaves in African economies.

Given the often-inappropriate strategic focus of these zones (where a few firms often benefited from lucrative special deals with influential politicians and could afford to produce the wrong goods in otherwise uncompetitive factories), the fact that they remained enclaves limited exacerbation of the economy-wide distortions. However, disconnect with the domestic private sector has worsened their perception by local business people. In some cases, the poor logistics and weak supply chain (both a reflection of limited clustering) have led these firms to rely heavily on imports (with industries such as electronics or even apparel often showing import ratios of well over 60 percent); in such situations, currency devaluations have compounded the distortion of net exports. As a result, transaction costs have remained too high. Even with distortive protection by governments, they failed to yield enough business volume to be credible entities.

Moving forward, five major issues should be addressed:

- The frequency and intensity of economic policy reversals in some African countries is still perceived to be high, making long-term business decisions and commitment difficult and particularly risky;

- The infrastructure deficit, which increases input and transaction costs to non-competitive levels; and the poor logistics and supply chain for intermediate inputs, which are essential ingredients for firm competitiveness;
- The difficulty of securing land for mass-production activities;
- The generally poor quality of public service delivery, which reflects a weak business environment; the rigidity of labor laws in some countries and inefficiency of business practices/culture;
- Political economy and governance issues in many African countries: the misuse of SEZs by a few well-connected business people to circumvent tax laws; this has led to opposition by small business owners.

SEZs have also often only attracted polluting industries and import-dependent activities that perpetuate low-skill assembly activities with low value added. In some countries, firms within these zones are perceived as ignoring basic labor rights, pay low wages, and escape from regulations on workplace health and safety conditions. Lessons from successful SEZs show that, once they attract a large cluster of firms in assembly, it becomes possible to localize the production of intermediate inputs, which in general are more capital-intensive and have larger economies of scale. Successful SEZs have also moved to make their policies and business practices consistent with International Labour Organization (ILO) and World Trade Organization (WTO) rules.

In order to address all these issues and embark successfully on the path to the industrial and technological upgrading that leads to sustainable growth and create jobs, African countries should expand the scope of privileges of their zones, and remove the distortions and inefficiencies that have characterized them. They should consider building SEZs with specialized facilities that are configured to the needs of specific industries and sectors. Such CBIPs could be of various sorts depending on the particular industries to be promoted, which should be consistent with the country's revealed or latent comparative advantage.¹³ With their specialized facilities customized to the unique needs of target industries, they may be

¹³ BIPs should not try to promote static comparative advantage. They should provide support for upgrading and diversification into new industries. However, their goals should not be too ambitious as is often the case in countries where policymakers advocate the promotion of dynamic comparative advantage. The nuance here is important. Theories of dynamic comparative advantage typically attempt to help firms to enter industries that are to a country's future comparative advantage. Because of endowment constraints in the African context, firms in those industries would not yet be viable in a competitive market even if the government helped them with coordination and externality compensation. By contrast, CBIPs should aim at helping firms enter industries with latent comparative advantage. Under that scenario, firms would be immediately viable and require no subsidies or protection once the government provides coordination and externality compensation.

airport-based zones to support air-based activities (fruits and vegetables or cut-flower exports for instance), agro-processing, or even simply financial services zones aiming at promoting off-shore activities. Well-designed and well-managed CBIPs can facilitate the integration of African firms into GVCs.

7.1 Good general principles

The industries undertaken in CBIPs should be carefully selected and consistent with each country's revealed or latent comparative advantage to ensure that they make the best possible use of the abundant factor (typically low-skilled labor) and can become competitive in international markets without excessive forms of government protection.¹⁴ At least in their initial phase, they should host labor-intensive, assembly-oriented activities such as textiles, apparel, footwear, electrical and electronic goods. Within such industries, the scope of activities should be expanded to include not only manufacturing and processing but also commercial and professional services such as warehousing or transshipment.

All investors (foreign and local) should be treated equally. New legislation, rules and regulation should therefore be adopted to reduce the probability of distortions in incentives. Moreover, there should be a unique set of fiscal incentives for all promoted industries, regardless of their location (within the zone or outside).

Deliberate efforts should be made to integrate CBIPs into national economies. In order to preempt the inevitable domestic criticism, social fears and political economy issues, the strategic focus of CBIPs should be on generating manufacturing jobs and absorbing large segments of the low-skill labor force; promoting skills, industrial, and technological upgrading¹⁵; improving the economy's endowment structure and moving toward higher-value activities, but at a realistic pace; encouraging linkages between CBIP-based firms and local firms so that the zones provide demonstration effects for success and serve as catalysts to broader reforms; and compliance with ILO labor standards. It is indeed important to communicate the message that, for most people in the labor force across the continent of Africa, the alternative to employment in such CBIPs would be low-productivity, low-income informal activities, underemployment in urban areas, unprofitable and highly risky agricultural work in rural areas, unemployment, and the perpetual trap of poverty. Even with

low levels of formal education, many otherwise unskilled workers could still be employed in CBIPs that specialize in basic assembly operations.

7.2 Effective institutional arrangements

CBIPs that are privately owned, managed, and operated should be encouraged. But they could start as public-private partnerships, with public provision of off-site infrastructure such as roads and public-private funding of on-site facilities. Governments can provide direct financial support or guarantees to build infrastructure and facilities in the zone. Private-sector participation can take many different forms: basic partnership with shared risks and rewards with governments; concession agreements; "build-own-operate," "build-operate-transfer," or "build-own-operate-transfer" arrangements (see FIAS 2008). Successful models of CBIPs include a variety of contract types, often with public-private partnerships that evolve over time. A model that has been popular recently involves "equity-shifting" arrangements, with a private contract manager of a government zone being allowed to exercise a purchase option once pre-defined levels of performance have been reached.

Even well-designed CBIPs can only succeed if they are backed by strong political commitment from the highest levels of governments to improve the business environment and quickly remove all the obstacles that may stand in the way of implementation. A good institutional framework for preparation could be an inter-ministerial committee headed by a political "champion" who has the credibility and power to make things happen. That "champion" should also be the main interface between CBIPs developers and firms and all government entities. He/she should be able to respond quickly and effectively to the requests from the business community. But he/she should be insulated from political pressures to please any domestic political constituency.

7.3 Facilities and services

African policymakers should work closely with private-sector operators to fully equip and service CBIPs with purpose-build facilities, which can then be put up for sale or lease. The provision of industry-specific on-site infrastructure is an important determinant of transaction costs and competitiveness. It helps attract firms and facilitate the clustering and the development of sub-contracting rela-

14 In setting the strategic focus of the old SEZs, most African governments clearly did not follow the rigorous prescription suggested here, and there is no guarantee they will do so now. Moreover, in a second-best world, it is easy to argue that almost any industry needs a subsidy. A good indication of whether policymakers are serious about creating CBIPs with competitive potential will be their choice of industries.

15 It is estimated that SEZs in Sub-Saharan Africa generally contribute nearly 50 percent of exports. It can be inferred from their impact on the diversification of the region's export base that they also contribute to skills upgrading.

tionships among them. Private zone developers should be allowed to supply utilities services (water, power, sewerage, and telecommunications) to CBIP firms. As governments across Africa continue to need substantial private-sector financing for infrastructure projects, attention should turn to the region's still underdeveloped capital markets as a potential channel for fund-raising.

The development of CBIPs will be made easier if African governments are willing to find land parcels and secure titles for lease to private zone developers. In many African countries, the legal framework allows for an enduring influence of the state bureaucracy on land distribution and land rights. Governments are reluctant to hand over the power resource of land distribution, and state control is legitimized as historically and socially fair. Such control offers potential spaces for rents and bureaucratic arbitrariness. State ownership, and especially the power to redistribute land plots, makes citizens and business people vulnerable to arbitrary actions of local bureaucrats who decide about which individual is granted access to land. CBIPs represent a good opportunity for implementing land reforms gradually, in a way that can generate quick wins to all stakeholders, and improve collective welfare. The fact that countries such as Ethiopia, with a long history of strong resistance to the privatization of land property rights to individual plot holders, are willing to consider changes in their land tenure policy, may be the sign of progress—and the recognition that there is no other viable alternative.

In expanding the range of facilities and amenities available within CBIPs, public and private partners should consider not only industry-specific factories and infrastructure but also a wide array of services such as high-speed telecommunications and Internet services, common bonded warehouse facilities, training facilities, maintenance and repair centers, product exhibition areas, on-site customs clearance and trade logistics facilities, on-site housing, on-site banking, medical clinics, shopping centers, childcare facilities, etc. Developing a zone not as stand-alone, but rather as an integrated industrial, commercial, residential, and recreational entity, allows developers to diversify their potential sources of revenue and offset the potential low profitability of certain activities with higher margins in others. In many well-managed private zones in East Asia, as much as half of total annual revenue is derived from business support services and other sources of income.

7.4 Political economy issues

Political economy concerns are legitimate but only for the traditional type of SEZs which host firms in industries that defy comparative

advantage. Firms in these industries are not viable in an open, competitive market. Their existence and continuous operation often depend on large subsidies and protection, which create opportunities for rent seeking and corruption, and make it difficult for the government to abandon interventions and exit from distortions. CBIPs are meant to promote a completely different development model: the promotion of industries that are consistent with the economy's latent comparative advantage. Firms are viable once the constraints to their entry and operation are removed. The incentives provided by the government to the first movers are to be temporary and small, solely for the purpose of compensating for their information externality. In that context, the issues of pervasive rent seeking and the persistence of government intervention beyond its initial timetable can be mitigated. Selecting labor-intensive industries with economies of scale (so that there are incentives for foreign investors to localize in Africa) and potential for upgrading (to open up future possibilities for domestic value-added creation) would generate the kind of quick wins that policymakers need in order to build their own domestic political capital and pursue reforms.

It must also be noted that African countries are not all confronted with the most complex internal political economy problems that require the adoption of second- or third-best economic policies. In some countries, minimum wage and other labor laws are actually much less binding than they appear in the books. In such countries, especially those where basic transportation, energy, and telecommunication infrastructure could be improved quickly, CBIPs should be much bolder in their design and implementation to become "freeports." Instead of being mainly export drivers, they could be large platforms for private investment and catalysts for knowledge spillovers throughout the entire national economy and beyond, and even serve as a basis for regional hubs in specific industries. In such countries, CBIPs—selected on the basis of their economic rationale and not for political considerations—could:

- Cover much larger areas, therefore allowing greater flexibility to firms in their choice of plant location and opportunities for inter-firm linkages;
- Allow full access to the domestic markets on a duty-paid basis—that is, lift the traditional requirement of exporting 80 percent or more of the production, and allow instead unrestricted sale to domestic consumers as long as all applicable import taxes and other duties are fully paid;
- Allow firms to engage in any legal economic activity they deem

profitable, including manufacturing, warehousing, transshipment, etc.; registered firms or individuals could also be offered duty-free privileges to permit the introduction of all types of merchandise, which can then be sold at the retail or wholesale level, or even consumed within the zone area.

Alternatively, African policymakers may consider best practices from Ireland, Taiwan (China) and Korea, and allow duty-free access to inputs for local firms just as it is the case for CBIP-based firms. Domestic producers, especially small and medium-sized enterprises, could then benefit from tax credits, and rebates on duties paid on imported goods and services used in products sold to CBIP-based firms. Local suppliers could then import intermediary products and components on the basis of letters of credit initiated by CBIP-based firms. The latter could also provide domestic firms with technical assistance or financing arrangements as part of sub-contracting arrangements. Such policy measures aiming at fostering backward linkages would eventually help diffuse political opposition to CBIPs.

Governments could work closely with firms in competitive industries to support training and apprenticeship for workers, promote study tours and personnel exchanges, and implement programs tailored for purchasing and technical managers of export-oriented firms based in CBIPs, to help their local suppliers achieve high-quality standards and meet the required delivery times. By bringing local business leaders into the picture and creating the conditions for them to fully share the success of CBIPs, governments would foster job generation and weaken domestic sociopolitical resistance to the new policy (including from trade unions).

Finally, political commitment at the highest levels of government should be clearly signaled to potential foreign investors, who must be convinced all constraints on businesses in CBIPs will be removed quickly. Personal engagement by Presidents, Prime Ministers, and other high-level government officials in Africa will be needed to convey the message that once the policy is adopted, there will be no reversal. Well-prepared, well-targeted (to specific industries) and well-advertised visits to countries where potential investors are based would help overcome skepticism and give credibility to the new policy. In preparation of such trips, African political leaders should anticipate on the main reasons for skepticism on the part of potential foreign investors; they should identify the big barriers to entry and be prepared to make a convincing case about their support to CBIPs.

8 HOW COULD DEVELOPMENT BANKS SUPPORT AFRICAN INDUSTRIALIZATION?

How can low- and middle-income countries, which are by definition limited in their fiscal base and capacity for domestic resource mobilization, finance their industrialization process? All African policymakers are confronted with this question. In searching for answers, they typically start with the observation that investment rates across the continent are generally low, and must be increased for their economies to grow, create employment opportunities, and combat poverty.

Some African central banks have tried to help stimulate national economies through monetary policy—especially during economic downturn episodes—by lowering interest rates and reserve requirements or purchasing government bonds held by financial institutions to make more resources available to the banking system (quantitative easing). But most African central banks conceive their role as maintaining price stability, which they consider the best way of contributing to economic growth. Moreover, despite recent progress, the prevailing economic conditions in many African countries are still characterized by significant slack, high unemployment and underemployment, and the need for major reforms to improve the business environment. The magnitude of the economic challenges facing the continent and the uncertainty that has marked the lower growth period caused by declining prices of commodities are evidenced by the consistently high levels of capital flight, a phenomenon which is also accompanied by a new buildup in external debt.¹⁶

The traditional Keynesian strategy to deal with crisis situations where private-sector confidence and investors' willingness to take risk and to spend are both low consists of complementing loose monetary policy with higher public spending or lower taxes. Restoring aggregate demand through government action is then seen as the most effective way of replacing private spending that has not taken place. Most high-income countries have done just that to combat the global recession. But that strategy may well work for business cycles and fail when it comes to confronting structural issues of growth and development of the types facing African countries. Furthermore, the prevailing conventional wisdom—codified mainly in the multi-year macroeconomic programs negotiated with the International Monetary Fund (IMF)—is one that advocates "expansionary fiscal contraction".

16 Some African countries that have gained debt reduction through the HIPC (Highly Indebted Poor Countries) Initiative are now being lured into contracting new debt from non-Paris Club lenders, often on non-concessional terms.

As a result, many African economies currently find themselves in a conundrum: aggregate demand is still too low and there is no realistic perspective that it will increase sufficiently and rapidly enough to provide enough employment opportunities for poverty reduction. But it is financially, economically and even politically impossible to increase government deficits—not least because of IMF program constraints; and, even if central banks were willing and able to implement extraordinary loose monetary policies, this would not be effective to produce high, sustained growth. What is needed is therefore a development financing strategy that sustains demand without creating unsustainable fiscal deficits.

A straightforward solution would be the financial strengthening of African development banks—a general capital increase of African Development Bank (AfDB), for instance, and the operationalization of the African Investment Bank (AIB).¹⁷ Strengthening the financial capabilities of the AfDB and launching a well-functioning AIB would indeed help Africa meet two objectives simultaneously: it could provide much needed long-term financing to its economies thereby expanding and modernizing infrastructures (energy, transportation, telecommunications, water supply), while maintaining sustainable fiscal balance. Raising AfDB's capital and making the AIB operational would not require African governments to increase their borrowing significantly. These development banks would stimulate confidence by supporting large-scale, regional investment projects and programs that create employment opportunities. But those investments would be made by the private sector or by some local governments, with the funding necessary being borrowed or raised by the AfDB or AIB—not by central governments. For instance, while an initial capital endowment would be required, perhaps on the magnitude of at least \$50 billion dollars to make it credible, the AIB would be able to raise a sizeable multiple of that amount for its operations.¹⁸

Stronger development banks would go a long way to addressing the short-term market failures in private capital markets that currently exist and prevent African economies from getting funding for their development projects. The need to fund infrastructure projects is particularly important, as their benefits to society as a whole are typically much larger than their private financial return to their

owner. Yet, let alone, private investors would not necessarily finance them. Moreover, the process through which public infrastructure projects are selected and funding allocated almost anywhere—especially in African countries—makes them subject to political pressure and elite capture. In these often authoritarian and unstable countries, the weak institutional framework, fuzzy budget rules, lack of transparency and accountability mechanisms, and the need to accommodate political cronies at all levels of government and beyond, often lead to random and costly decision making.

Development banks could also help implement Growth Identification and Facilitation (GIF) strategies¹⁹ for industrializing African economies. While African countries are typically small open economies that largely depend on trade, many of them have relied to a large extent on construction and real estate to sustain growth in recent years while manufacturing and exporting industries were lagging behind or even declining. By making long-term finance available for sound investment, development banks could support new export industries that reduce Africa's dependence on foreign borrowing to pay for foreign products. Their support for projects and programs must be viable in strategic areas identified and appraised rigorously through GIF.

One puzzling finding from economic research is the observation that low investment has not been the major constraint on development in Africa. While the region's total investment rate has been below that of developing countries in other regions, public investment rates is often not too much lower. "Any statement about whether African investment was the source of poor performance would therefore have to analyze the composition of that investment—and whether more public investment, an instrument under government control, would have benefited the continent" (Devarajan et al. 2002, p. 1). Given that poor track record of public investment and the long history of failure of development banks across the developing world, the development banks would have to implement a rigorous, professional and transparent operational framework.

Learning from successful similar institutions, the AIB would operate on a "not for profit maximizing" basis and borrow on the capital markets to finance its projects. It would offer partial or full guarantee

17 In February 2009, the African Union established the creation of an African Investment Bank "to foster economic integration and development through investment in development projects in line with the objectives of the Union." Article 5 of the Protocol signed in Addis Ababa (Ethiopia) noted that "the Headquarters of the Bank shall be in Tripoli, the Great Socialist People's Libyan Arab Jamahiriya," which may not have helped the Union to move forward with the project.

18 The countries of the European Union (EU) initially contributed \$50 billion in capital for the European Investment Bank, which currently borrows a further \$420 billion and is therefore able to finance investments worth more than \$470 billion (Skidelsky and Martin 2011). While the EU has an economy almost ten times the size of the economies of Africa (\$16 trillion in 2010), the same principle would work for the AIB if the institution is credibly set up and managed.

19 See Lin and Monga (2011).



Santiago Island, Cape Verde. Watershed Management Project 2012 © 2017. African Development Bank Group

of repayment on bonds issued by investment projects—by bearing the risk, it would substantially reduce the cost of funding. The development banks would also issue their own long-term bonds with modest premium over US T-bills to raise money and finance large-scale projects directly. There are many good examples of institutional and governance setups that would allow the AIB to fund major infrastructure projects while consistently avoiding losses and maintaining a very low rate of delinquencies.²⁰

9 IN CONCLUSION

Opposition to industrial policy is often based on a misreading of economic history. It is also a matter of semantics. Again, all governments in the world, regardless of their politics, engage in industrial policies every single day.

It is true that the record of the early industrial policies is mixed. Critics of the industrial policies implemented in many of the countries have argued that they introduced profound distortions: limited public resources were used to pursue unsustainable import-substitution policies. To reduce the burden of public subsidies, governments have sometimes resorted to administrative measures—granting nonviable enterprises in prioritized industries a market monopoly, suppressing interest rates, over-valuing domestic currency and controlling prices for raw materials. Such interventions themselves have introduced further distortions, sometimes even causing shortages in foreign exchange and raw materials. Preferential access to credit has deprived others of resources. There has been a high opportunity cost.

The experience of industrial policy, especially in developing countries, has mostly been one of failure. Governments adopted various

²⁰ Besides the European Investment Bank, the list of well-known cases includes the German Kreditanstalt für Wiederaufbau (KfW), the Korea Development Bank and the Development Bank of Japan.

policy measures to promote industrialization throughout the developing world (Chenery 1961). In Asia and the Middle East, and later in Africa, the transformation of territories previously considered colonies or semi-colonies into independent states was accompanied by strong nationalist sentiments. Lack of industrialization—especially the possession of large heavy industries, which were the basis of military strength and economic power—had forced China, India and other areas in the developing world to yield to the colonial powers. In the 1950s and 1960s, many political leaders there—especially the first-generation leaders who led their people to political and economic independence after long periods of revolution or struggle—were motivated by the desire to modernize their nations and reclaim their dignity on the international scene.²¹ That mindset often led them to give priority to the development of large, advanced heavy industries, which they considered prerequisites and symbols of nation-building and modernization (Lal and Myint, 1996).

Old industrial policies failed because of the strategic mistake of setting goals inconsistent with the level of development of the country and the structure of its endowments at a given time. Many poor countries made the mistakes of trying to develop capital-intensive industries at a time when they had little or no capital, and when they actually needed labor-intensive industries to absorb their large labor force. They ended up creating economic distortions.

The ‘Washington Consensus’ shifted the policy pendulum toward market fundamentalism. By focusing obsessively on government failures and ignoring the structural issues they assumed that free markets will automatically create spontaneous forces to correct structural differences among countries. Yet market failures from externality and coordination are inherent in the process of structural change. Without the government’s facilitation, the spontaneous process that ignites the change is either too slow or never even happens in a country. Unfortunately, the ‘Washington Consensus’ neglected this. It also neglected the many existing distortions in a developing country that produced second-best arrangements to protect nonviable firms in the structural priority sectors in the country. Without addressing the firms’ viability, the attempt to eliminate those distortions could cause their collapse, large unemployment, and social and political instability. For fear of such dire consequences, many governments reintroduced disguised

protections and subsidies which were even less efficient than the old subsidies and protections.

Most countries, intentionally or not, pursue an industrial policy in one form or other, which broadly refers to any government decision, regulation, or law that encourages ongoing activity or investment in an industry. After all, economic development and sustained growth are the result of continual industrial and technological change, a process that requires collaboration between the public and private sectors. Historical evidence shows that in countries that successfully transformed from an agrarian to a modern economy—including those in Western Europe, North America, and, more recently, in East Asia—governments coordinated key investments by private firms that helped to launch new industries, and often provided incentives to pioneering firms (Gerschenkron 1962; Amsdem 1989; Wade 1990; Chang 2003).

Even before the 2008-2009 global financial crisis and subsequent recession, governments around the world provided support to the private sector through direct subsidies, tax credits, or loans from development banks in order to bolster growth and support job creation. Policy discussions at many high-level summits sought to strengthen other features of industrial policy, including public financing of airports, highways, ports, electricity grids, telecommunications, and other infrastructure, improvements in institutional effectiveness, an emphasis on education and skills, and a clearer legal framework. The recent global crisis has led to a rethinking of governments’ economic role. The challenge for industrial policy is greater, because it should assist the design of efficient, government-sponsored programs in which the public and private sectors coordinate their efforts to develop new technologies and industries.

The case for industrial policy is even stronger in low-income countries where there is strong theoretical justification for it. Most African countries are endowed with relatively abundant labor or natural resources but have relatively scarce capital. The price of labor or natural resources will be relatively low and the price of capital relatively high in a developing country, which will therefore have a natural disadvantage in heavy manufacturing industry, requiring large capital inputs and small labor inputs, because its costs of production will be inherently higher than in an advanced country.

21 China for instance, had been defeated repeatedly by the industrialized powers after the Opium War in 1840, and become a quasi-colony, ceding extraterritorial rights in treaty ports to 20 foreign countries; its customs revenues had been controlled by foreigners, and it surrendered territory to Britain, Japan and Russia. The Indian subcontinent, which was not significantly less developed than Britain in the seventeenth century and, before 1800, was a major supplier of cotton and silk textiles in international markets, including to Europe, was also reduced to be a British colony. Many countries in Asia, Africa, and Latin America had gone through similar processes.

This is the notion of comparative advantage, which prescribes that countries produce goods and services requiring their relatively abundant factors as inputs, thus incurring lower costs than anyone else.

The specific policy framework and instruments for successful industrial policy depend on each country's particular situation. The general rule should be to encourage only industries in which the economy has a clear comparative advantage—and the private sector usually identifies these industries and sectors quite well. When this is done, public policy should help identify tradable industries that have performed well in growing countries with similar endowment structure, and with a per capita income about double their own.

If domestic private firms in these sectors are already present, policymakers should identify and remove constraints on those firms' technological upgrading or on entry by other firms. In industries where no domestic firms are present, policymakers should aim to attract

foreign direct investment from the countries being emulated or organize programs for incubating new firms. The government should also pay attention to the development by private enterprises of new and competitive products, and support the scaling up of successful private-sector innovations in new industries.

In countries with a poor business environment, SEZs or industrial parks can facilitate firm entry, foreign direct investment, and the formation of industrial clusters. Finally, the government might help pioneering firms in the new industries by offering tax incentives for a limited period, co-financing investments, or providing access to land or foreign exchange. This approach provides policymakers in developing countries with a framework to tackle the daunting coordination challenges inherent in the creation of new, competitive industries. It also has the potential to nurture a business environment conducive to private-sector growth, job creation, and poverty reduction.



South Africa. 2011. Kalagadi Manganese Mine © 2017. African Development Bank Group

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Box 1:

AFRICA'S DECADE OF INDUSTRIALIZATION



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In today's interdependent global economy, Africa remains a weak link. If the world is to achieve the Sustainable Development Goals, thereby completing the United Nations 2030 Agenda for Sustainable Development, it must help Africa accelerate its development by promoting rapid and responsible industrialization.

Africa is by no means destined to lag behind the rest of the world economy. On the contrary, it could easily become a global economic powerhouse – and within the next decade. But, to fulfill its economic potential, Africa must industrialize.

The importance of this has been stressed repeatedly at recent international forums, including last August's Sixth Tokyo International Conference on African Development (TICAD VI), and the G20 summit in Hangzhou, China, the following month. For the first time, the G20 placed industrialization in Africa – and all of the Least Developed Countries (LDCs) – on its agenda. The African Union's Agenda 2063 also supports this drive.

The recent UN General Assembly resolution declaring 2016-2025 the Third Industrial Development Decade for Africa is yet another push in this direction. The organization that I represent, the UN Industrial Development Organization (UNIDO), has been tasked with

operationalizing and leading the implementation of the concomitant program, including mobilizing the needed resources.

All of these declarations and commitments are an important first step. But they will mean little unless they are translated into concrete and effective action that advances African industrialization, creates jobs, and fosters inclusive and sustainable economic growth and development. The question is how.

The short answer is money and action. We must challenge the international community and development partners to back their words with real financial commitments. And we must build partnerships to operationalize programs that will enable Africa to become the world's next main engine of economic growth.

Such programs must recognize and tackle the acute challenges the continent faces. The economic growth experienced in recent decades has not been structurally driven, sustainable, or fully inclusive. Indeed, growth rates vary widely across the continent, and not all Africans are benefiting. Though the middle class in Africa has expanded markedly in recent years, generating a consumer boom and boosting domestic investment, many people still struggle to make a living. Unemployment rates are high, especially for young people and women – a reality that drives many Africans to head north.

To keep them home, Africa's economies must move beyond producing raw materials to build dynamic and competitive manufacturing sectors with higher value added. Here, Africa must draw on the opportunities presented by participation in global and regional value chains. New and innovative industrial-development strategies, as well as carefully tailored measures to attract foreign direct investment, must be introduced.

Of course, to develop such strategies and participate effectively in industrial value chains, Africans need knowledge. Investment in education and skills training is imperative to facilitate successful and lasting industrialization. By understanding and drawing on proven innovations from around the world, Africa could leapfrog more developed countries technologically, building the capacity to produce more sophisticated, higher-value goods. Knowledge of other countries' experiences will also help Africa to avoid the pitfalls of unbridled industrialization – particularly environmental damage. Africa must ensure that its industrial-development strategy includes effective environmental safeguards.

Africa is well placed to industrialize. Beyond its massive natural-resource endowments, the continent has a favorable demographic profile (its rapidly growing population means that it will soon have the world's largest workforce) and high urbanization rates. It also benefits from a highly educated diaspora. But industrialization is never automatic. Governments must step up to address market failures, while planning, implementing, and enforcing industrial policies that address the shortcomings of previous ineffective versions. They must then institutionalize these new policies in national and regional development strategies.

To succeed, governments will need adequate capacity, competence, and legitimacy to mobilize and interact with all stakeholders, thereby creating an attractive investment climate. The necessary reforms will open the way for public-private partnerships, which can provide investment for infrastructure development and maintenance. They will also facilitate cooperation with international organizations and development finance institutions, which can provide additional funds, while helping countries to upgrade their productive capacity.

A recent report, prepared for the Hangzhou G20 Summit, features a number of recommendations for Africa. It suggests support for agriculture and agribusiness development and linking them with other sectors, as well as measures to boost resilience to price shocks. Furthermore, the report emphasizes the need to deepen, broaden, and update the local knowledge base, invest in energy- and material-resource efficiency, and promote green technologies and industries. Other recommendations relate to trade and regional integration, leveraging domestic and external finance, and promoting what it calls the "New Industrial Revolution."

My numerous meetings with African leaders and visits to dozens of countries across the continent have convinced me that Africa is committed to industrialization. In fact, the process is already underway in many countries, including Ethiopia, Ghana, Rwanda, and Senegal. By offering our commitment and support, we can enable these countries to realize inclusive and sustainable development for the benefit of everyone.

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CHAPTER 2

INCLUSIVE AND SUSTAINABLE STRUCTURAL TRANSFORMATION IN AFRICA; FORGING AHEAD

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OVERVIEW

This chapter 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 to 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 chapter 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 TOWARDS 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 share prosperity (Smirzai 2012).

- First, a vibrant manufacturing sector stimulates technological change with the adoption, mastery, and development of im-

1 See AfDB (2016a) "Bank Group Industrialization Strategy for Africa 2016-2025."

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).

proved 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

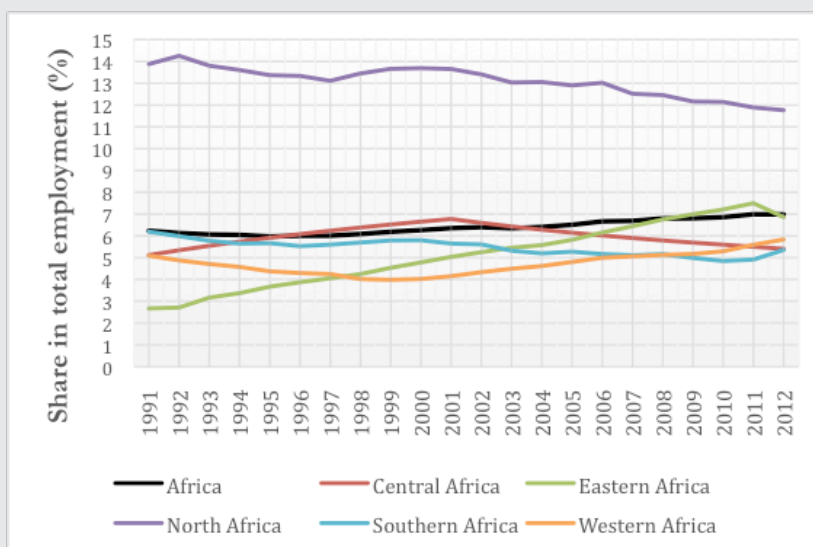
In this section we analyze at the performance of the manufacturing sector on two aspects: manufacturing production and manufacturing exports.

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

Figure 2.1: Manufacturing Employment Shares in Africa and its Sub-Regions, 1991-2012



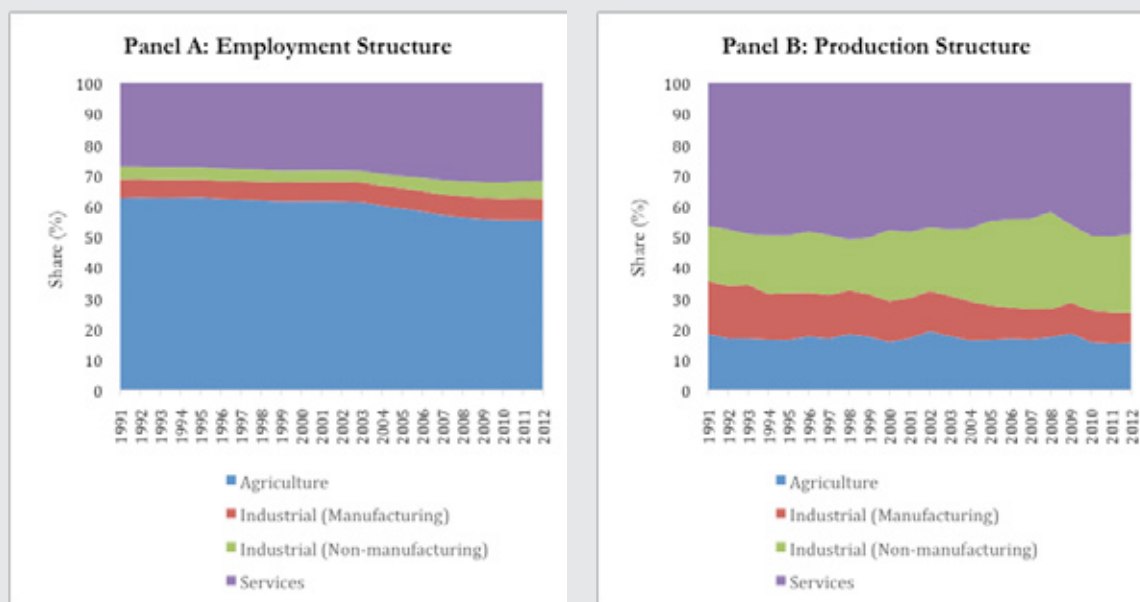
Source: Own calculations, based on Haraguchi et al. (2017)

25%, Western Africa for 25%, and North Africa for 29%. Within the continent as shown in Figure 2.1, 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%.

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 2.2), while labor has moved primarily from agriculture to service, 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 additional indirect employment due to strong productive linkages with other sectors, in particular the service sector. For example, manufacturing firms are increasingly outsourcing their non-core operations, such as warehousing, transport, human resource management. 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 2.2: 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 2.3). 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 2.3), 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.⁴ 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).

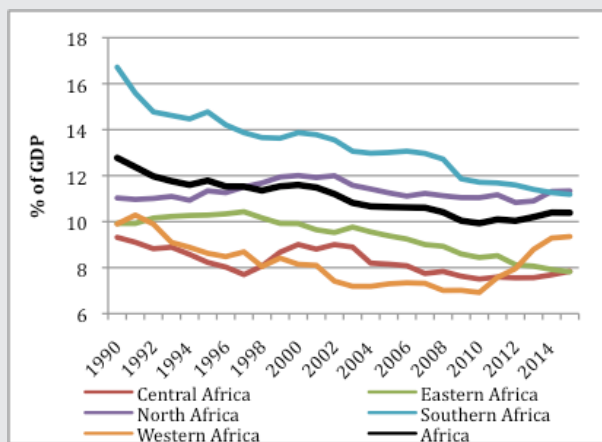
Some countries have been fairly successful. Nigeria and Ethiopia recorded the fastest growth rates between 2010 and 2015, with MVA per capita growing respectively at 11.3% and 9.3%; followed by Equatorial Guinea (5.8%), Burkina Faso (4.4%) and Niger (4.3%). In contrast, Libya and Central African Republic 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 2.4). 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

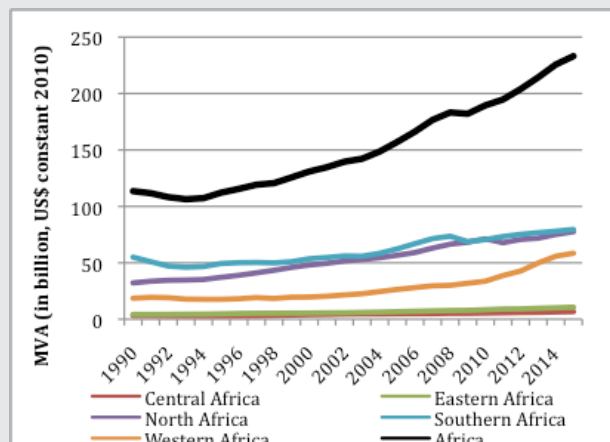
4 In 2015, North America (48.1%) and Europe (25.55%) were the largest world manufacturers, followed by Asia (18%) and Latin America (6.4%).

Figure 2.3: MVA Share and Levels in Africa, 1990-2015

Panel A: Share of MVA in GDP

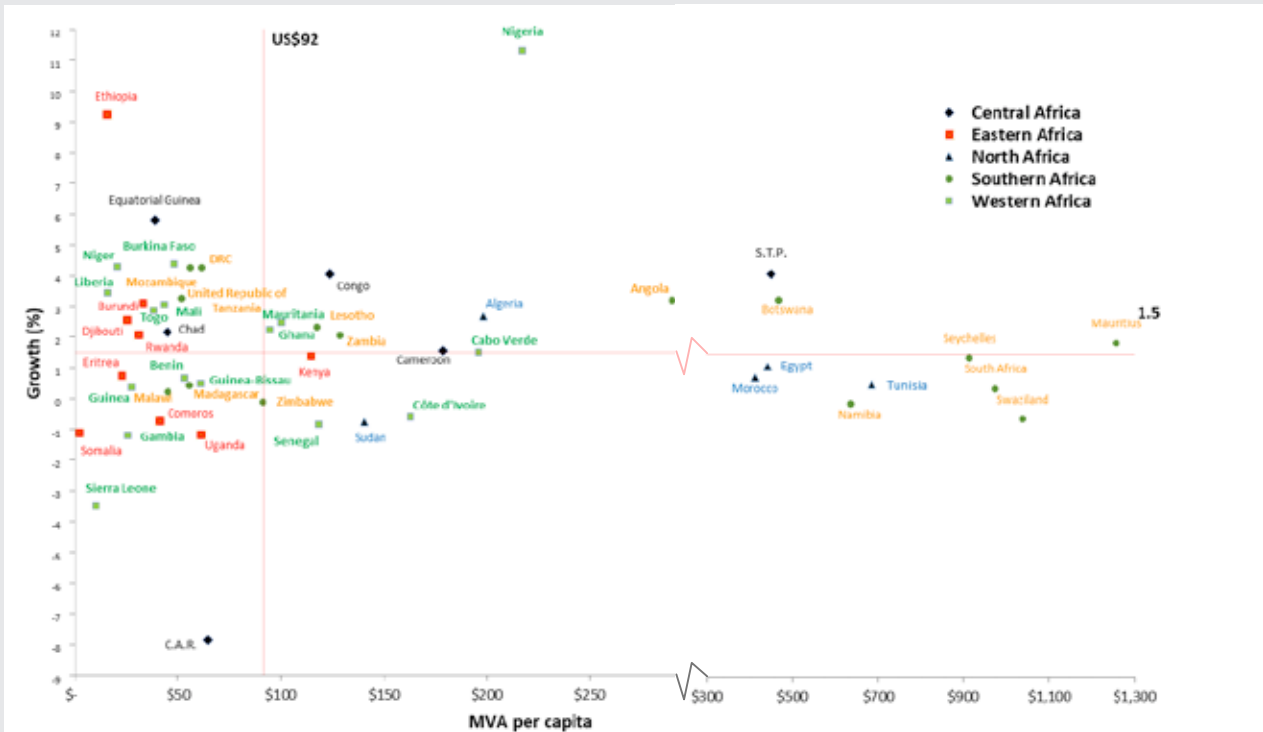


Panel B: MVA Levels



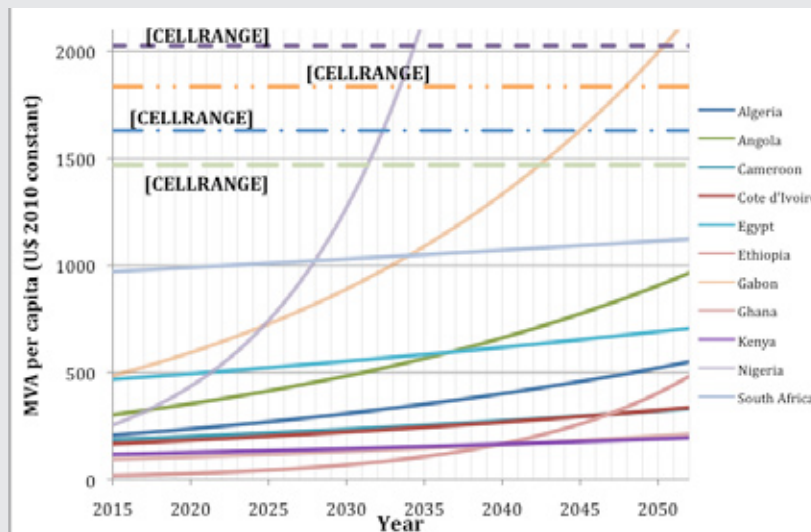
Source: Own calculations, based on UNIDO (2016)

Figure 2.4: MVA per capita, 5-year average 2011-2015 (US\$ constant 2010)



Source: Own calculations, based on UNIDO

Figure 2.5: Simple MVA per Capita Projection for Selected African Countries



Source: Own calculations, based on UNIDO (2016)

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. 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.⁵

Figure 2.5 below also shows MVA per capita projections for selected African countries, using the last 5-year average growth rates. This simple projection exercise shows the number of years that might be required for the selected countries to reach the 2015 MVA per capita levels of emerging-group countries such as Chile, China, Thailand or Turkey; among those countries, Chile has the lowest MVA per capita level. In this exercise, we are abstracting from the fact that these emerging countries’ MVA levels would be increasing. The results suggest that Nigeria could reach Chile’s 2015 MVA per capita around 2037, while Gabon would reached the same level around

2045. No other country in the African group would reach Chile’s 2015 level within the relevant timeframe (that is 2052). This shows that 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.

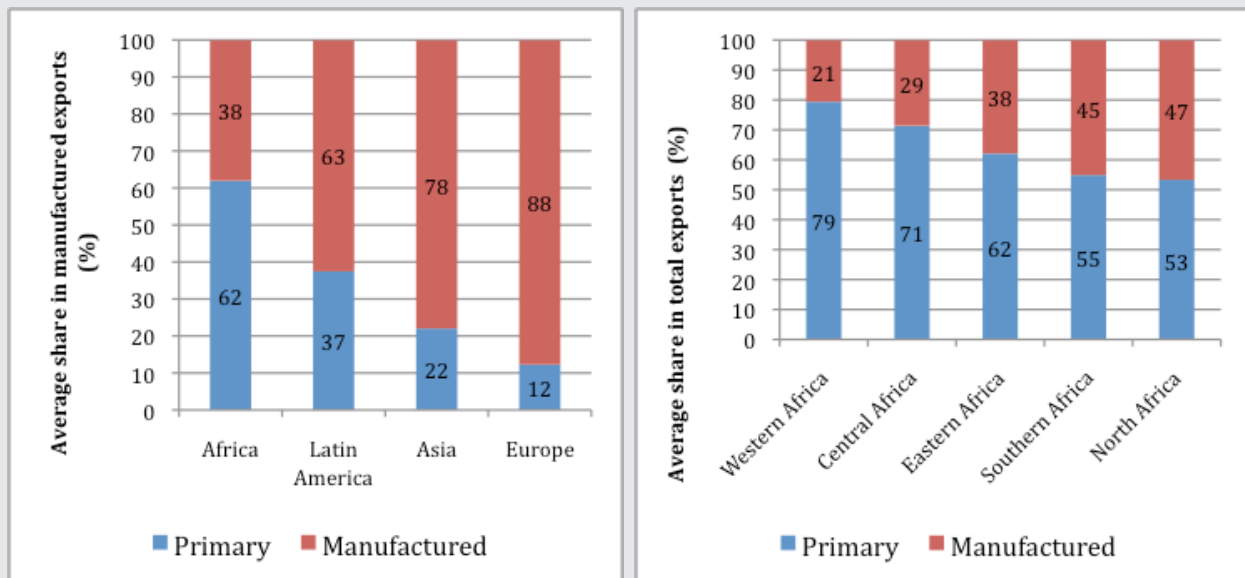
Manufactured exports

African countries mainly export primary products, 62% of Africa’s total exports, the highest among world regions (figure 2.6), 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

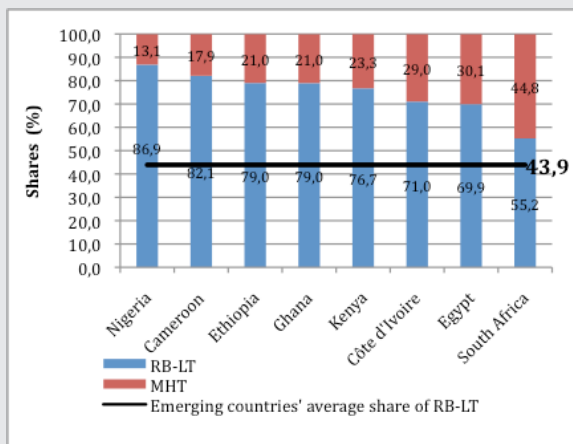
5 See also UNCTAD/UNIDO (2011).

Figure 2.6: Structure of Manufactured Exports by Regions, 2010-2014



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

Figure 2.7: Technological Structure of Manufactured Exports 2010-2014



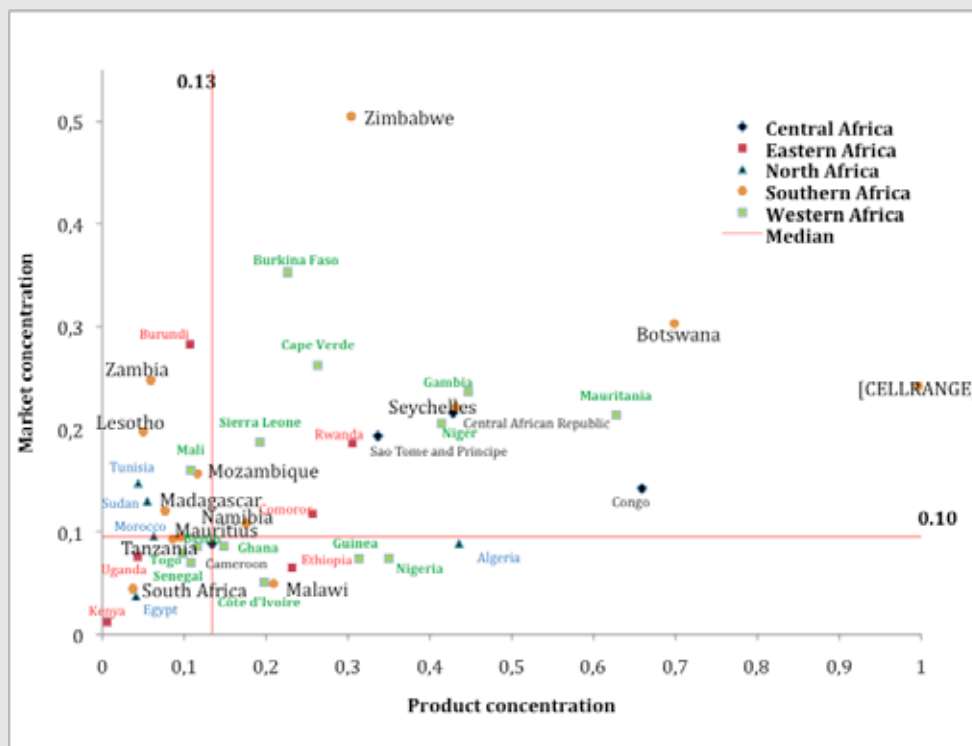
Source: Own calculations, based on UN (2016).

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 2.7). The share of resource-based and low-technology exports in South Africa's 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.

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

Figure 2.8: Market and Export Diversification, 5-year Average (2010-2014)



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

and 0.13 for Asia, and 0.05 and 0.11 for industrialized countries.⁶ 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.

Angola and Botswana which have above-median product and market concentrations (figure 2.8). Petroleum products account for more than 90% of Angola's manufactured exports, with more than 80% absorbed by China. Pearls and precious stones represents 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.

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 (Klinger 2009).

Although the manufacturing of technologically advanced products may be challenging, a developing country can reap exports bene-

fits 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 2.1: World's Most Dynamic Manufactured Exports above 20 Billion, 2010-2015

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

Source: Own calculation, based on UN (2016).

6 The small range of the market diversification index can be explained by the limited number of markets in the world compared to the number of products.

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.⁷ 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.⁸

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 Ncube 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 towards 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

7 IBP Inc. (2017) "African Countries, Mineral Industry Handbook, Volume 1 Strategic Information and Regulations."

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.

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 garments 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,⁹ 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 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 diver-

sified 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 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

9 Libya, Djibouti, Eritrea, Sudan, Egypt, Ethiopia, Kenya, Uganda, Burundi, Rwanda, Tanzania, Malawi, Zambia, Zimbabwe, Angola, Democratic Republic of the Congo, Mauritius, Madagascar, Comoros, Seychelles, Mozambique, Botswana, Lesotho, Namibia, South Africa, and Swaziland

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 global value chains (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 Development 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, 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, 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 print-

ing, 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 (3.4%), 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 improve 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

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 system

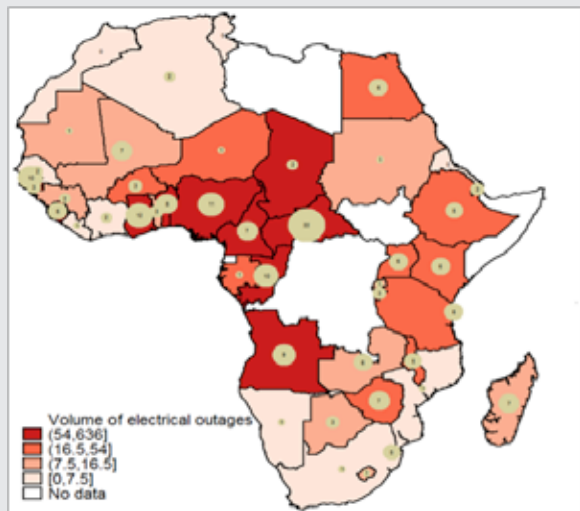
(road, rail, and freight) are necessary for providing a cheap way of moving raw materials to producers and manufactured goods to consumers, increasing manufacturing competitiveness. East Asian firms save close to 70% in transportation costs relative to their African counterparts, while Latin American 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 2.9). 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.

Figure 2.9: Volume of Electrical Outages and Enterprise Losses, 2005-2015



Source: Own calculations, based on World Bank (2015).
 The “volume of electrical outages” represents the average number of hours of electrical outages per month. In the bubbles, we have the percentage of sales lost due to electrical outages.

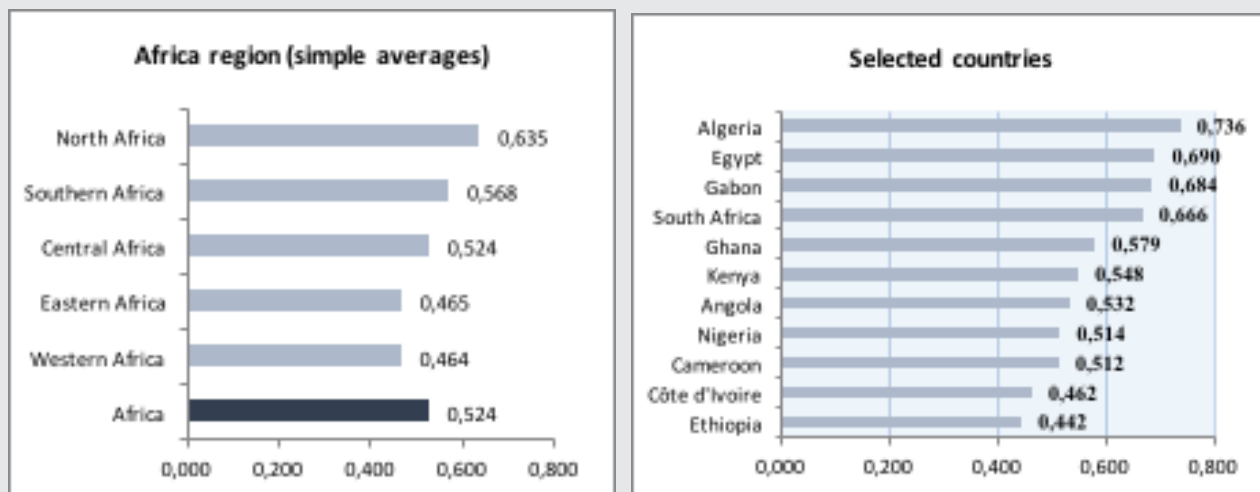
Building human capital

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 2.10), it has only five countries in the group of high human development group (Mauritius, Seychelles, Algeria, Libya, Tunisia) and 12 in the medium human development group (UNDP 2015).

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 pro-

Figure 2.10: HDI values, Africa region and selected African countries



Source: Own calculations, based on UNDP (2015)

ductive 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.

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%.

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 constraint 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.

Box 2.1: Education Support by the African Development Bank

In the past 10 years, the African Development Bank invested US\$1.6 billion in education, science, and technology, benefiting more than 6 million young Africans. The Bank supports education, science, and technology as part of its strategic priority to “improve the quality of life of the people of Africa,” in line with the Sustainable Development Goals (SDGs) and the 2063 Agenda of African Union. The AfDB approach for Education, Science and technology contributes to 9 of the 17 SDGs and is a vehicle to achieve the other AfDB High 5 priorities.

AfDB projects, policy and technical advice have generally contributed to:

- **Increasing access to education and training.** Vehicles includes scholarships programmes; infrastructure development for basic service delivery, and for skills development in priority economic sectors (eg. Côte d'Ivoire, Kenya, Malawi, Equatorial Guinea, 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 programmes; and strengthening labor market information systems (Côte d'Ivoire, Morocco, Rwanda, Zambia);
- **Revitalizing scientific research** through competitive funds; faculty exchange; joint research programmes; business incubators for research products and Public Private Partnerships; knowledge transfers programmes; 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); and

- **Fostering regional integration in Africa** through support to regional centers of excellence and network of knowledge in sectors such as ICT, Water and Energy sciences; Biomedical Sciences; 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 reverse the structural weaknesses their education system 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 programme will be anchored in priority sectors such as agriculture, energy, ICT, infrastructure, pharmaceuticals, nutrition, and green and blue economies.

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.

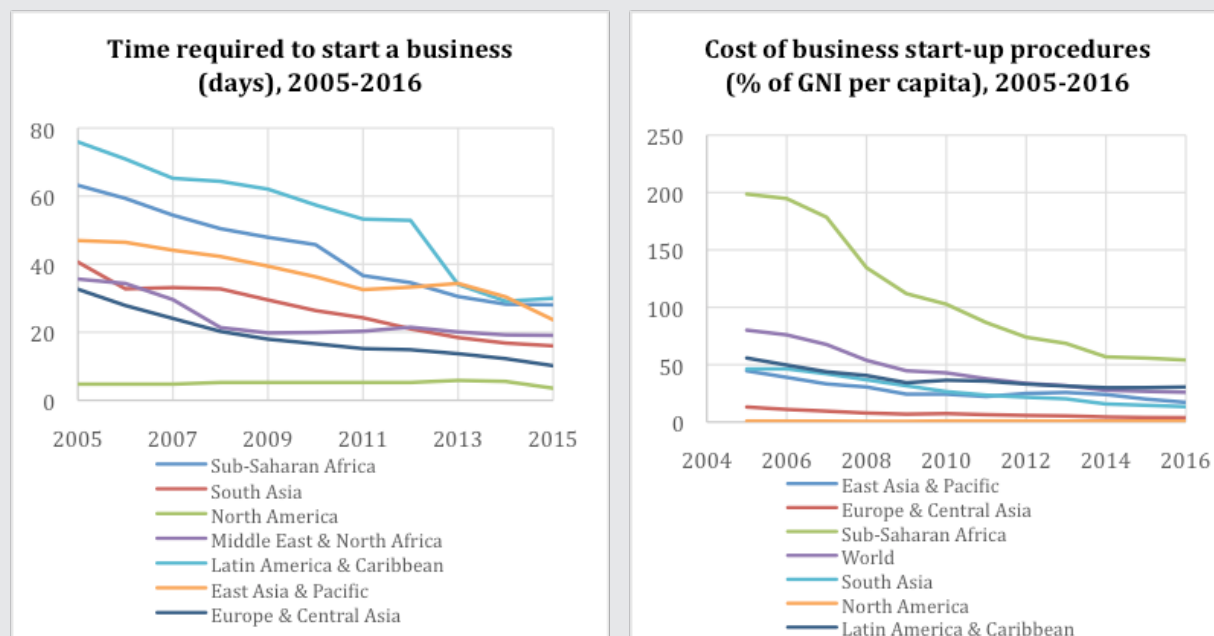
Although still dominated by banks, capital markets are developing and beginning to do more in Africa's financial markets, increasing long-term financing for industrial and infrastructure development. There now are about 25 stocks exchanges on the continent, with the Johannesburg Stock Exchange the most developed.¹⁰ 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.

10 See <http://www.african-exchanges.org>, accessed on 13/02/2017.

Figure 2.11: Time and cost for starting business by regions 2005-2016



Source: Own calculations, based on WDI (2017)

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 Lybia, Botswana, Chad, Rwanda, and Tanzania) have sovereign wealth funds (SWFs) with an asset base of over 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 for invest in longer-term projects, including industrial projects. While the above sections discussed internal resource mobilization in the sector above, considerable amounts of resources are also available at the international level,

looking for profitable investments 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 2.2).¹¹

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

11 For details on industrialization, see AfDB (2016a) "Bank Group Industrialization Strategy for Africa 2016-2025."

Box 2.2:

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 \$3.5 billion per 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 credits 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.

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 provide 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 which 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 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 advantages 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

12 <http://www.epu.gov.my/en/development-policies/human-resource>. Accessed 02 February 2016.

how latecomer economies can catch up following a three-dimensional sequential process: the intra-industry dimension, the inter-industry 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 re-location 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 that cover multiple industrial activities, organized by issues (technology, human resources, etc) or including sector-specific chapters (electronics, machinery, food processing, etc.). Box 2.3 below gives potential issues that can be discussed.
- Sector-specific master plans that aim at the development of one specific industry such as textile and garment, food processing or electronics.
- Issue-specific master plans, which are strategies targeting cross-cutting issues of industrial development such as transport and logistics, small and medium enterprises, education and training or energy.
- Regional development master plans that are strategies for the industrial development of particular regions or, economic zones.

For each issue, a basic structure for the chapters in an industrial strategy blue-print is proposed in box 2.4.

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 labour 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 suggest 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;

Box 2.3: Basic Framework of an Industrial Strategy Blue-print

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 (including 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 (including business registration and licensing)
- Industrial Associations and Relations

Quality Issues

- Standards for Industrial Development (ISO, quality, environment, accounting, etc)
- Certification, Award and Labeling
- Testing and Metrology

Technology Issues

- Skills and Technology
- Innovation, R&D for Industry (including 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 Issues

- Coordination (Inter-ministerial)
- Public Private Partnership
- Budget allocation

A few 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.

Source: Ohno 2009, 2011.

Box 2.4: Possible Basic Structure for an Industrial Strategy Chapter

For individual chapters, a typical basic structure include the following:

Vision

For the overall plan: to clarify the purpose of industrial promotion, the importance of industry for national development and relative to other sectors, its positioning in the national, regional, and global markets. For the sectoral plan: to clarify the purpose of industrial promotion of this sector, its importance for industrial and national development and relative to other sectors, its (future) positioning in the national, regional, and global markets.

Situational analysis

To analyze the current status, potentials, and obstacles of the domestic sector. The following aspects can be reviewed: past performance of output, capacity, demand, investment, export and import, localization; current status of product mix, number and size of producers, spatial distribution of production units, quality, technology (foresight), competitors and competitiveness; demand forecast (possibly with alternative scenarios); domestic, regional and global market trends.

Objectives

Set long- and medium-term targets, quantitative and/or qualitative, which should be presented with a clear time frame which should normally extend over a few to several years. It is important to avoid setting too many (quantitative) criteria when implementation capabilities are not well developed.

Policy issues

Identify specific aspects that need to be addressed by policy to realize vision and achieve the objectives that have been set. The policy issues need to be analyzed and prioritized. Actions must be proposed for either removal of negatives or strengthening of positives (to be subsequently elaborated into detailed action plans).

Plan of action

An action plan matrix is a large table that translates analyses and proposals conducted in previous chapters into concrete actions. It is crucial that the progress of the matrix is monitored and reported to the government at regular intervals. Typical components are: action, activities (sub-actions), output/result, timeframe/deadline, indicators of success, source of verification, responsible organization(s), and cooperating organizations.

Incentives and tools

To promote the industrial sector or specific industries, a number of policy instruments can be used including financial incentives (loans, tax and subsidies), public procurement contracts, grants and awards, linkage creation (industrial subcontracting, supplier database), establishment of industrial parks and clusters, or special economic zones.

Source: Ohno 2009, 2011.



African Masks. © 2017. Shutterstock images

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).

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 manufactur-

ing 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 global player in their sector of activity.

Fourth, as 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 extensively in East Asia to develop or improve the compet-

itiveness 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 pro-

Box 2.5:

Illustrating Policy Learning: the Venture Capital Industry in Israel

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 3 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 Traded concluded that the weak links in the system were both financial and marketing management 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 e.g. 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 ten private Israeli VC funds, i.e., 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 (Erich, 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'.

Source: Avnimelech et al. 2005.

curements 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.



Togo. 2012. Lome Container Port © 2017. African Development Bank Group

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

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

Country	Establishments	Employees	Wages and salaries	Output	Value added	Gross fixed capital formation	Female employees
Algeria	1984 / 1996	1967 / 1996	1967 / 1996	1967 / 2010	1967 / 2010		1989 / 1996
Angola	1992 / 1993	1969 / 1993					1992 / 1993
Benin		1975 / 1981	1974 / 1981	1974 / 1981	1974 / 1981		
Botswana	1981 / 2005	1981 / 2012	1981 / 2012	1981 / 2013	1981 / 2013	1981 / 1998	1998 / 2012
Burkina Faso	1993 / 1998	1974 / 1998	1974 / 1983	1974 / 1983	1974 / 1983		
Burundi		1969 / 2012	1971 / 2012	1971 / 2012	1971 / 2012		
Cameroon	1989 / 2008	1970 / 2008	1970 / 2002	1970 / 2008	1970 / 2002	1970 / 2002	2008 / 2008
Central African Republic	1981 / 1995	1973 / 1993	1973 / 1993	1973 / 1993	1973 / 1993	1973 / 1993	
Congo		1968 / 1988	1968 / 1988	1968 / 2008	1968 / 2009		
Côte d'Ivoire	1981 / 1997	1966 / 1997	1966 / 1997	1965 / 1997	1965 / 1997	1994 / 1997	1993 / 1997
Egypt	1981 / 2012	1964 / 2012	1964 / 2012	1964 / 2012	1964 / 2012	1967 / 2012	1991 / 2012
Eritrea	1992 / 2012	1992 / 2012	1992 / 2012	1992 / 2012	1992 / 2012	1992 / 2012	1992 / 2012
Ethiopia	1990 / 2013	1990 / 2014	1990 / 2014	1990 / 2014	1990 / 2014	1990 / 2013	1991 / 2009
Ethiopia and Eritrea	1981 / 1989	1965 / 1989	1965 / 1989	1965 / 1989	1965 / 1989	1980 / 1989	1983 / 1989
Gabon	1991 / 1995	1963 / 1995	1966 / 1995	1963 / 1995	1966 / 1995	1991 / 1995	
Gambia	1981 / 2004	1975 / 2004	1975 / 1995	1975 / 2004	1975 / 2004	2004 / 2004	1993 / 2004
Ghana	1981 / 2003	1963 / 2003	1963 / 2003	1963 / 2003	1963 / 2003	1963 / 2003	1993 / 1993
Kenya	1981 / 2012	1963 / 2013	1963 / 2013	1963 / 2013	1963 / 2013	1967 / 1998	1987 / 1998
Lesotho	1982 / 2009	1982 / 2009	1980 / 2009	1980 / 1985	1980 / 1985	1982 / 1985	2001 / 2009
Liberia	1981 / 1986	1972 / 1986	1980 / 1986	1972 / 1985			
Libya		1964 / 1980	1964 / 1980	1964 / 1980	1964 / 1980	1964 / 1980	
Madagascar	1981 / 1986	1967 / 2006	1967 / 2006	1967 / 2006	1967 / 2006	2001 / 2006	2001 / 2006
Malawi	1981 / 2010	1964 / 2012	1964 / 2012	1964 / 2012	1964 / 2012	1964 / 2010	2010 / 2010
Mauritius	1981 / 2012	1968 / 2012	1968 / 2012	1968 / 2012	1968 / 2012	2002 / 2012	1995 / 2007
Morocco	1982 / 2013	1976 / 2013	1976 / 2010	1976 / 2013	1976 / 2013	1985 / 2013	1992 / 2013
Mozambique	1986 / 2000	1967 / 2000	1963 / 2000	1963 / 1998	1967 / 1973	1971 / 1973	
Namibia	1994 / 1994	1994 / 1994	1994 / 1994	1994 / 2013	1994 / 2013		
Niger	1990 / 2003	1999 / 2003	1995 / 2002	1990 / 2003	1990 / 2002	1990 / 2002	1999 / 2003
Nigeria	1981 / 1996	1963 / 1996	1963 / 1996	1963 / 1996	1963 / 1996	1980 / 1996	1991 / 1994
Rwanda	1999 / 1999	1999 / 1999	1999 / 1999	1999 / 1999	1999 / 1999		
Senegal	1981 / 2012	1974 / 2002	1974 / 2002	1974 / 2012	1974 / 2012	1974 / 2012	1990 / 1990
Somalia		1967 / 1986	1967 / 1986	1967 / 1986	1967 / 1986	1967 / 1977	
South Africa	1985 / 2011	1963 / 2011	1963 / 2009	1963 / 2010	1963 / 2010	1963 / 1990	1985 / 1985

Country	Establishments	Employees	Wages and salaries	Output	Value added	Gross fixed capital formation	Female employees
Sudan (including South Sudan)	2001 / 2001	1972 / 2001	1966 / 2001	1966 / 2001	1966 / 2001	2001 / 2001	
Swaziland	1981 / 2011	1967 / 2011	1967 / 2011	1967 / 2011	1967 / 2011	1968 / 2011	
Tunisia	1993 / 2013	1963 / 2013	1963 / 2007	1963 / 2007	1963 / 2010	1963 / 2006	
Uganda	1984 / 2000	1963 / 2000	1963 / 2000	1963 / 1989	1963 / 2000	1963 / 1989	
United Republic of Tanzania	1981 / 2010	1965 / 2010	1965 / 2010	1965 / 2010	1965 / 2010	1965 / 2010	1990 / 2010
Zambia	1983 / 1994	1963 / 1994	1963 / 1994	1963 / 1994	1963 / 1994	1963 / 1990	1994 / 1994
Zimbabwe	1983 / 1996	1963 / 1996					1996 / 1996

Source: UNIDO (INDSTAT 2, 2016)



Unique handmade colorful ceramic pots stacked for sale on African roads. © 2017. Shutterstock images



CHAPTER 3

INDUSTRIAL POLICY IN AFRICA: FROM STATE LEADERSHIP TO THE INVESTMENT CLIMATE

John Page



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1 INTRODUCTION

Africa's post-independence leaders – like many others in developing countries in the 1960s and 1970s – were attracted to industry and industrial policy. Following the prevailing economic wisdom of the time and post-colonial political imperatives, many newly independent African countries pushed state-led, import-substituting industrialization. High – and frequently excessive – protection from import competition and state investment in enterprises were widely used to promote the growth of manufacturing. The results of the early industrialization drive were disappointing, however, and by the 1980s most African countries found their industrial sectors in decline. Manufacturing had proved heavily import dependent and costly.

The global economic shocks of the 1980s brought a period of macroeconomic stabilization and a new view of appropriate economic policies to Africa. In contrast to the post-independence period a new actor – the International Financial Institutions (IFIs) – emerged as a dominant voice in the policy dialogue with African governments. The International Monetary Fund and the World Bank responded to Africa's economic difficulties with “adjustment lending” – operations that offered budget and balance of payments support in return for an agreed set of policy reforms. The IFIs views of appropriate policy reflected a shift in development thinking away from assigning a leading role to the state and toward reliance on markets for resource allocation and on the private sector as the main engine of economic change. This “Washington Consensus” view left little room for industrial policy.

By the turn of the 21st Century Africa had made a remarkable economic turn-around. Beginning around 1995 economic growth accelerated. Macroeconomic management had improved

dramatically across the continent and rising commodities prices, combined with new resource discoveries propelled a significant number of African economies. In the past few years, however, there has been growing recognition that to sustain growth Africa's economies will need to transform themselves through more rapid growth of high productivity sectors, including industry (ACET, 2014). The mainstream view of how to accelerate structural change focuses on the “investment climate” – the physical, institutional and regulatory environment within which firms operate. A number of countries, however, have gone beyond the investment climate, using the space created by the donor community's commitment to national ownership to introduce more active approaches to industrialization. Some industrial policies are back on Africa's agenda.

This paper reviews the three phases of industrial policy in Africa. It is largely based on the results of country case studies of the industrialization experience of eight African countries.¹ These economies – Ethiopia, Ghana, Kenya, Mozambique, Nigeria, Senegal, Tanzania, and Uganda – were all among the region's early industrializers. They are also all among the stars of the region's growth turn-around. What is striking about the eight is that despite considerable diversity in geographical location, resource endowments and history, they share a remarkable similarity in their approaches to industrial policy. And, while “Africa is not a country”, the eight countries policy histories have much in common with the rest of the region. Mauritius is included because it is an interesting outlier. From an early point it pursued a very different approach to industrial development; one that was more aligned with East Asia than Africa.

2 STATE OWNERSHIP AND IMPORT SUBSTITUTION (1960-1980)

When Africa gained independence, post-colonial governments saw industrialization – and in particular the growth of manufacturing – as a key driver of modernization and economic development. Leaders in English- French- and Portuguese- speaking Africa shared similar views, strongly shaped by a desire to modernize their mainly agrarian economies and reduce dependence on the former colonial powers. But the drive to industrialize was also guided by the prevailing thinking on economic development of the post-independence period.

¹ The country studies are the output of a joint African Development Bank, Brookings Institution and UNU-WIDER project, Learning to Compete (L2C). References to individual studies are indicated only once at the time the country case study is introduced.

2.1 Development Economics and Industrial Policy in the Post-Colonial Period

At the beginning of the 1960's a majority of the leading thinkers in the new field of economic development would have been likely to articulate variations on the following themes. Structural transformation – the shift of resources from low productivity to higher productivity employment – was the key to economic growth in poor countries. The process of structural change entailed industrialization, which in the first instance should be directed at satisfying the home market (Berg, 1971). In order to “jump start” the industrialization process a “big push” was required, involving a major increase in the rate of investment, and because many investments were thought to be interdependent, development plans for the coordination of investment decisions were essential (Chenery, 1959; Killick, 1978). Planning was viewed as a complement to markets, which in poor economies were often either incomplete or missing, and as an essential guide to the formation of long term investment plans by private agents (Scitovsky, 1954).

The centerpiece of the industrialization effort was the development of large-scale, often capital-intensive manufacturing industries owned and managed by the state. Protection of the domestic market against imports was viewed as the necessary condition for successful industrialization. As early as 1965 the Economic Commission for Africa (ECA) endorsed an active role for the state in industrial development and structural change. African governments invested heavily in infrastructure and manufacturing, setting up state-owned enterprises (SOEs) for domestic production of previously imported consumer goods, processing of exports of primary products (agricultural and mining), and building materials. In some countries SOEs also engaged in the assembly or production of electrical apparatus and machinery.

The state became the central actor in the industrialization story for a variety of reasons, often depending on the political ideology espoused by post-colonial governments. Nationalism was certainly a key motivation. The stress on import-substituting industrialization was particularly appealing to post-colonial leaders as a way of securing “economic independence” (Killick, 1978). There was also a remarkable degree of congruence between Marxist and mainstream views of the essential elements of economic transformation. Thus, “African socialist” regimes also embraced industrialization, although they tended to place greater emphasis on the need for central planning and government control of the economy (Berg, 1964). Finally, virtually all post-independence governments stressed the need to do away with past colonial exploitation. Because the

dominant model of economic growth (Lewis, 1954) argued that the principle source of investment in an economy with surplus labor was an increasing share of national income accruing to capitalists, political leaders concluded that the state should take on the role of the capitalist. In that way the state could avoid further deteriorations in an already highly skewed distribution of income and decide upon the most efficient way to distribute to surplus.

2.2 Post-Independence Country Experiences with Industrial Policy

In Ethiopia a conscious move to stimulate industrial growth began in the mid-1950s with the formulation of the First Five-Year Plan (Gebreesus, 2014). The plan emphasized the development of import-substituting light industries producing consumer goods for the domestic market. Various policy measures were introduced to encourage investment in manufacturing including high tariffs, banning certain imports, fiscal incentives, and provision of credit. The plan also proposed direct investment in selected capital intensive sectors such as oil refining, cement, sugar, and textiles. In 1974 the Ethiopian Revolution brought the Marxist Dergue government to power. It nationalized most of the privately-owned modern medium- and large-scale manufacturing enterprises, which were then reorganized under state corporations. Public ownership was to be the central driver of the industrialization effort. Private investment was restricted one project not to exceed approximately a quarter of a million US dollars. Imports were subjected to increased quantitative restrictions and higher tariffs. A central planning body was established in 1984 and a Ten-Year Perspective Plan was formulated. The main focus of the industrial development plan was to promote import-substituting, labor intensive industries. The nationalizations and continued systematic exclusion of the private sector from engaging in major economic activities restricted private investment to micro- and small-scale manufacturing activities. By 1986, one decade after the revolution, state-owned enterprises (SOEs) produced 95 per cent of the value added and employed 93 per cent of the workers in modern manufacturing.

When Ghana gained independence from Britain, the Nkrumah-led Convention People's Party (CPP) government flagged industrialization as the keystone of the modernization and development of the country (Ackah et.al., 2014). The industrial development program emphasized import substitution, supported by high levels of protection, both to transform the industrial structure and to reduce dependence on the UK. It was Nkrumah's belief that every imported item, which could have been manufactured locally, provided that conditions allowed it, added to Ghana's continuing

economic dependence on the colonial system (Killick, 1978). By the late 1960s, effective protection, exceeded 100 per cent for almost half of manufacturing industries, creating a strong incentive for a shift from consumer imports to the production of locally made manufactures using imported inputs. Government invested heavily in infrastructure and manufacturing, including producers' goods. Development of the electrical, electronic and machinery industry was viewed as necessary to provide the inputs needed to expand the industrial sector (Steel, 1972). To achieve the objective of state-led industrialization, the government took over many private enterprises – particularly those tainted by illegal activities – and formed joint ventures with others. The share of state-owned enterprises (including joint ventures) in Ghana rose from 18.9 per cent of gross manufacturing output in 1962 to 41.6 per cent in 1967.

In the early years of independence – 1963-1970 – Kenya also adopted an industrialization strategy that relied on import substitution, but in contrast with many other post-independence governments it included a smaller role for the state (Nguï et al. 2014). Government provided both direct support and tariff protection to privately owned industry. This strategy was a carryover from colonial policies, and its objectives were rapid growth of industry, reduced balance of payment pressures, and greater indigenous participation in the sector. An Industrial Development Bank was established in 1973 for the purpose of promoting joint ventures between domestic and foreign investors in import substituting activities. Early results were encouraging. During the first decade of independence manufacturing grew at an average rate of 8.0 per cent, outpacing both the rest of the Kenyan economy and other industrial sectors in Africa.

Mauritius was unique among post-independence African countries in pursuing an alternative strategy for industrial development. Part of the economy was very open, while the rest was quite closed (Rodrik, 1997). It began promoting industrial development in 1964 with an incentive regime designed to encourage import substitution by private investors. Tax holidays, priority access to credit, and duty free entry of capital goods were offered in conjunction with increased import tariffs and quotas on final goods. But, by the time of independence in 1968 very little industrial investment had taken place. In 1970 the government shifted gears and began attempting to attract local and foreign private investment into exports. An Export Processing Zone (EPZ) was created which offered duty free entry of inputs, free repatriation of capital and greater flexibility in labor relations. EPZ factories were scattered throughout the island in small or individual industrial sites, public and private. The government provided infrastructure and factory spaces as part of an incentive framework to confer some cost competitiveness

to industry. These policies attracted both foreign and domestic investors. Manufacturing value added grew at 17 percent per year between 1970 and 1977. Manufactured exports increased from zero to 24 percent of total exports over the same period. By 1985 apparel exports from the EPZ had overtaken sugar as the island's main foreign exchange earner.

Beginning in 1975 the government in Mozambique implemented a set of national and socialist policies designed to make the public sector the dominant economic actor (Cruz et al., 2014). The third Frelimo Congress of 1978 identified industry as the main driver for structural transformation of the economy, and the fourth Congress in 1983 called for greater emphasis on import substitution. Public policy aimed at “increasing industrial production to 12-15 per cent of GDP,... mainly in textiles, fisheries, metal works, mechanical apparatus, metallurgy and ship maintenance”.

The drive for industrial development in Nigeria began in the early 1960s with the first National Development Plan (1962-68). The main objectives of the industrialization strategy were to stimulate the growth of industry through import substitution and to increase indigenous ownership and management of industrial firms (Chete et al., 2014). The Second Plan (1970-74) coincided with Nigeria's newly acquired status as a major petroleum producer and marked a dramatic shift in policy from private to public sector led industrialization. The Third National Development Plan (1975-80), launched at the height of the oil boom, continued to focus on public investment in industry, especially heavy industries. The government undertook ambitious and costly investments in iron and steel, cement, salt, sugar, fertilizer, pulp and paper. Project preparation, feasibility studies, engineering drawings and designs, construction, and commissioning, relied greatly on foreign technical skills and services.

Between 1961 and 1969 Senegal pursued a strategy of state-led import substituting industrialization (Cise et al., 2014). Tariff and non-tariff barriers protected large manufacturing enterprises, which were often created by public investment. In 1970 an alternative policy regime, which emphasized the development of small and medium business was introduced. This signaled a retreat by the state from direct control of industry, but a continuation of the import substitution regime. Quotas, prior authorizations and prohibitions against the import of certain goods conferred quasi-monopoly status upon beneficiary firms. Domestic producers in certain sectors benefitted from additional protection against imports through special conventions, memoranda of understanding and administrative pricing.

At independence more than 80 percent of the manufactured goods consumed in Tanzania were imported, and manufacturing accounted for only 4 percent of GDP (Wangwe et.al., 2014). Between 1961 and 1969 a succession of government plans placed heavy emphasis on import-substituting industrial investments for basic consumer goods and related capital goods. Like Kenya, Tanzania initially sought to implement its industrialization program through local and foreign private investment. Tax incentives and investment promotion activities were deployed in a bid to expand FDI inflows. The outcome was not considered satisfactory, however, and in 1967 the Arusha Declaration – anchored in socialism and self-reliance – was introduced. Industrial production was primarily targeted to meet domestic demand, the major industrial firms were nationalized, and most subsequent investments were in public enterprises. Between 1965 and 1980 real investment in manufacturing grew by more than 21 percent a year. Foreign participation in industry was limited to joint ventures with the government, management agreements and the supply of capital equipment. Industrialization featured prominently in Uganda's Second Five-Year Plan (1966/67-1970/1971). The goal of the plan was to transform the economy over the period 1966-81 through industrialization (Obowna et.al., 2014). Manufacturing was planned to grow at twice the rate of growth of total GDP. The plan identified several industrial development priorities. These were: clothing, wood and cork, furniture and fixtures, footwear, rubber products, and iron and steel (Stoutjesdijk, 1967). Similar to Ghana, planned investments in the iron and steel sub-sector were identified as pivotal to future growth of manufacturing.

2.3 From Boom to Bust – the Early Industrialization Drive Falters

The state-led push for industrial development had considerable success in the 1960s. Manufacturing in Africa grew substantially faster than overall output between 1960 and 1970 and the share of manufacturing in total output increased. By 1970, however, the industrialization drive was beginning to lose steam and by 1975 growth of the manufacturing sector had begun to lag total output growth (Table 1). The countries that had pushed for industrialization shared a number of common characteristics. These included: excess capacity in import substituting industries – mainly final stage consumer goods – relative to domestic demand, very high import content of industrial production, and neglect of export oriented manufacturing. Levels of effective tariff protection to

the manufacturing sector were very high and the efficiency of production, measured in terms of international prices, was low. Indeed, in some cases final stage consumer goods were produced at negative value added in international prices. Public investment had begun to exceed the fiscal capacity of the state, and perhaps more importantly the state's capacity to manage the enterprises.

Declining output growth and underutilization of capacity in manufacturing became widespread in the second half of the 1970s and the early 1980s. Contrary to the intent of the import substitution strategy, dependence on imports actually increased in Africa. This was largely due to two trends that were widely shared among the economies that had pushed early industrialization: (i) the import-substitution manufacturing industries were heavily dependent on imported capital and intermediate goods, and (ii) the bias in favor of industry had led to a relative neglect of agriculture and to rising food imports (Steel, 1972). The terms of trade shock of the 1970s left Africa's early industrializers with chronic foreign exchange shortages. Most governments responded by rationing foreign exchange and permitting the exchange rate to become seriously overvalued. Governments attempted to sustain growth through expansionary macroeconomic policies leading to widespread loss of fiscal and monetary control. Growth ground to a halt and Africa entered its two-decade economic decline.

3 THE TRIUMPH OF THE “WASHINGTON CONSENSUS” (1980-2000)

Africa was not alone in confronting a rough period of economic growth in the 1980s. Latin America, which was the intellectual home of import substitution and its most important laboratory was also passing through a period of macroeconomic turbulence. Beginning in the early 1970s development economists began to document the efficiency costs of excessive protection of the domestic market.² By the 1980s, the economics profession had moved from a focus on the potential failings of markets in developing countries to embrace a “market friendly” approach to resource allocation in development.³ State owned enterprises also came under critical scrutiny and were widely found to be less efficient than privately owned firms (World Bank, 1983).

In response to the widespread balance of payments crises in Latin America the international financial institutions (IFIs) – mainly the

² The major contributions to this literature were due to Little, Scitovsky and Scott (1970) and their colleagues at the OECD Development Centre, Balassa (1971) and his colleagues at the World Bank, and Bhagwati (1978) and Krueger (1978) at the NBER.

³ The term is due to then World Bank Chief Economist Larry Summers. For a summary of the mainstream views on the role of markets in development see the World Bank, *World Development Report, 1991*.

IMF and the World Bank – developed a new set of policy-based lending instruments designed to stabilize the macro economy and improve resource allocation. These “structural adjustment loans” (SALs) provided quick disbursing funds for budget and balance of payment support in return for an agreed set of economic reforms that reflected the changing views on appropriate development policies.

3.1 Structural Adjustment and the Washington Consensus

By the second half of the 1980s a remarkable degree of consensus had been reached on the set of policy reforms that the IFIs would support with adjustment lending operations. These included:

- Fiscal discipline.
- Tax reform (to lower marginal rates and broaden the tax base).
- Interest rate liberalization.
- Maintaining a competitive exchange rate.
- Trade liberalization.
- Liberalization of FDI inflows.
- Privatization.
- Deregulation (ending barriers to entry and exit).
- Secure property rights.
- Focusing public expenditures on programs offering both high economic returns and the potential to improve income distribution, such as primary health care, primary education, and infrastructure.

Williamson (1990) famously termed these ten policy precepts the “Washington Consensus”. While the Washington Consensus referred to the common set of policy reforms being pushed by the Washington institutions – the US Treasury, the Federal Reserve Board, the IMF, and the World Bank – on Latin American countries, it quickly found its way to Africa. By 1988, 18 African countries had initiated structural adjustment programs and an additional 14 had borrowed to support reforms at the sectoral level.

The initial focus of public policy advice and conditionality by the IFIs in Africa was on macroeconomic stabilization. Better macroeconomic policies were defined as: “keeping budget deficits and inflation low, establishing fully convertible currencies and competitive exchange rates, and increasing public savings” (World Bank, 1992; p. 184). Many countries made major gains in macroeconomic stabilization, particularly after 1994. By 1997 fiscal deficits had dropped to 5.3 percent of GDP and averaged only 2.5 percent of GDP net of grant financing in the 31 countries covered by the Special Program of Assistance for Africa (SPA). Most countries financed part of the

residual deficit through concessional credits, making budgets more sustainable (World Bank, 2000). Policy reforms designed to reduce the role of government in the economy – liberalization of trade and finance, privatization, FDI promotion, and regulatory reform – followed closely behind stabilization. Because post-independence economic management was viewed as much more statist than was regarded as advisable, industrial policy of the type pursued in the post-independence period was largely abandoned.

Opening economies to international competition was the centerpiece of structural adjustment in Africa. Between 1985 and 2000 more than 30 African countries would undertake adjustment programs with the IFIs that incorporated exchange rate and trade policy reforms. Across Africa quantitative restrictions, once widespread, were replaced by tariffs. Tariffs were steadily lowered in most countries, and their dispersion reduced. Average rates of 30–40 percent in 1980 had fallen to trade weighted average tariffs of 15 percent or less by 2000 (World Bank, 2000). These milestones notwithstanding, a consortium of international organizations – including the World Bank – writing on Africa’s economic prospects at the turn of the century expressed some concern. “Liberalization”, they argued “is not yet anchored in an ideology such as export promotion, because reforms have been spurred by adjustment programs negotiated with international financial institutions” (World Bank, 2000; p. 32).

Divestiture of state owned enterprises was viewed as important for two reasons. First, it reduced the actual or contingent drain on the budget imposed by poor investment choices. Those enterprises that failed to elicit interest from private investors would be closed and liquidated as part of the fiscal consolidation. Second, the state had proved to be a poor entrepreneur. Even where firms were breaking even or providing a return to capital, the opportunity cost of the scarce managerial resources committed by the state to the public enterprises was high (Nellis, 1986). Redeploying such scarce talent in sectors judged to be more in line with the Washington Consensus – primary health care, primary education, and infrastructure – and allowing the private sector to manage industry would yield higher returns to the economy as a whole. Where domestic investors – and domestic managerial talent – were unable or unwilling to acquire state-owned assets, foreign investment was to be encouraged.

Privatization was more controversial in Africa than either macroeconomic stabilization or trade liberalization. In many African countries, the principal motivation for privatization was to placate the IFIs (Nellis, 2003). The commitment to privatization was neither widespread nor strong. Early in the structural adjustment period

closures and liquidations of SOEs took place more frequently than divestitures. In a sample of 15 African countries about 88 closures and liquidations of SOEs took place between 1979 and 1985. Over the same period only 23 sales of assets or equity took place, mainly sales of assets (Nellis, 1986). Divestiture picked up pace in the 1990s, but on average, African states privatized a smaller percentage—about 40 percent—of their SOEs than other regions, far less than in Latin America or the transition economies (Nellis, 2003).

3.2 Country Experiences in the Structural Adjustment Period

The last years of the Dergue regime saw a major decline in the Ethiopian economy. GDP fell sharply between 1987 and 1991. Manufacturing was the sector most affected by the economic turmoil. The number of establishments in the formal manufacturing sector shrank from about 380 in 1987 to 275 in 1991. Manufacturing value added declined by 40 per cent in 1991 alone with a corresponding decline in employment. Soon after it seized power in 1991 the transitional government announced that Ethiopia would return to a market-led economy. The first decade of the new regime was marked by a series of reforms supported by a SAP. The government implemented three phases of reforms. The first phase began with a devaluation of the Birr by about 150 per cent and

liberalization of the foreign exchange market. The maximum import tariff was lowered from 230 per cent to 80 per cent, and domestic prices were liberalized. A new investment code, labor and public enterprise laws were introduced, and market entry for privately owned banks and insurance companies was liberalized. The second and third phases of the economic reform program were aimed at further limiting the role of the state in the economic activities and promoting greater private participation in the economy. The economic reforms, coupled with macroeconomic stability, revitalized the manufacturing sector. In 1993 manufacturing value added grew by about 31 per cent, reversing the declining trend in the three preceding years. But the high growth period did not last long; growth of value added in the manufacturing sector in the period 1996-2003 averaged only 4 per cent per year.

Ghana was an early pioneer in structural adjustment. Its Economic Recovery Program (ERP) was introduced in April 1983. The ERP era fell into two periods, 1984-86 and 1987-89, the first concentrating on macroeconomic stabilization and the second on longer term, structural reforms. In the first phase there were three devaluations over a three-year period and a gradual reduction in the gap between the official and the parallel market exchange rate. An auction market



Morocco PADESFI (Financial sector development support program) 2014 © 2017. African Development Bank Group

for foreign exchange was introduced in 1986, and the unification of the exchange rate was finally accomplished the following year. The second phase involved restoring the infrastructure base of the economy, eliminating or reducing remaining price distortions and encouraging private sector development. The ERP sought to develop a more internationally competitive industrial sector with an emphasis on local resource-based industries. A significant feature of the ERP was the shift from the government as the driver of industrial development to the private sector. Policy reforms included a new investment code and establishment of the Ghana Investment Centre (GIC). In addition, the government initiated an SOE reform program which led to the privatization programs of the 1990s. The industrial sector, and manufacturing in particular, exhibited a strong, positive initial response to the reforms. Between 1984 and 1988 industry expanded at an annual average of 11.2 per cent, compared to -12.5 per cent during the preceding three year period. Manufacturing grew at 12.7 per cent on average. The turnaround was attributed to greater availability of imported and domestic inputs, provision of financial and technical assistance for the rehabilitation, modernization and expansion of potentially productive firms, and improved utilization of installed capacity.

During the 1980s and 1990s, Kenya implemented structural adjustment programs designed in part to strengthen competitiveness and reduce excess capacity in the industrial sector. Reforms included removing price controls and liberalizing imports through the removal of import and foreign exchange licensing and rationalization of the tariff regime. The reform measures were aimed at reducing the anti-export bias inherent in the past policies. Several institutional initiatives were undertaken to re-orient the economy toward exports including creation of an Export Promotion Council and an Export Compensation Scheme. Manufacturing Under Bond, Export Processing Zones, and import duty and VAT remission schemes, were created to improve exporters access to imported inputs at world prices (Bigsten et al, 2010). The supply response to the reforms was disappointing. The average annual growth rate of real GDP in manufacturing declined from 4.8 percent in 1980-1989 to 3 percent in 1990 - 1995 and to 1.3 percent in 1996-2000.

Between 1980 and 1986 Mauritius entered a stabilization and structural adjustment program with the International Monetary Fund and the World Bank. The island's economy had combined the EPZ with a domestic manufacturing sector that was highly protected (Rodrik, 1997). Starting in the early 1980s, the government began to dismantle most of the quantitative restrictions that had sheltered the non-EPZ part of the economy from foreign competition. By the early 1990s, there was significant

tariff reform as well. These reforms gave another boost to exports. Local investors operating as contract manufacturers set up apparel businesses clustered around larger, mainly foreign firms. The Development Bank of Mauritius, a public development bank, provided capital to domestic EPZ investors. The government also built several industrial estates around the island and leased sites to investors at subsidized rates. By 2000 Mauritian companies owned about 60 percent of the industry, garments from the EPZ constituted 76 percent of total exports, and some firms had started to vertically integrate their businesses, producing textiles (spinning and weaving) as well as garments.

Mozambique began an Economic Rehabilitation Program (PRE) in 1987 and adopted a more market friendly constitution in 1990. In both documents government was no longer seen as the main driver for industrialization and economic development. Instead, emphasis was placed on developing the private sector. Market forces were identified as the appropriate mechanism to guide resource allocation. Reforms under the PRE- included liberalization and privatization, including privatization of the financial sector. In 1997 the government approved an Industrial Policy and Strategy, which was intended to create an enabling environment for private sector development. Programs to develop micro, small and medium enterprises, for training and skill acquisition, and to promote foreign investment were launched. In the area of public investment, the strategy focused on the development of infrastructure, including industrial zones and the supply of water and electricity.

The introduction of the World Bank/IMF Structural Adjustment Program in Nigeria in July 1986 generated an intense debate between the proponents of more private enterprise and a market-oriented strategy for growth, and advocates of state-led development. The adjustment program consisted of stabilization policies and structural reforms in trade, regulation and state ownership. Between 1986 and 1993 a full range of Washington Consensus reforms were supported by the IFIs. Although the military regimes of the 1990s introduced an era of policy uncertainty, the general trend toward liberalization and a reduced role for the state continued. Adjustment had both positive and negative impacts on the structure and performance of Nigerian manufacturing. Tariff reductions cut duties on finished goods more than on intermediate inputs and raw materials, reducing effective rates of protection and increasing competition with foreign producers. Textile production contracted dramatically. Set against this there were new investments in industries that relied on local raw materials like palm kernel, cotton seed, and maize milling; rubber and vegetable oil processing; tanning of hides and skins;

sorghum malting; and soy milk processing. Overall, manufacturing declined as a share of the total economy from about 5.6 percent at the beginning of the 1980s to 4.3 percent in 2003.

Senegal turned to the Bretton Woods institutions in 1979 for a stabilization and structural adjustment program. The program was based on four pillars: controlling inflation and reducing the balance of payments deficit, restoring market forces in the allocation of resources, opening the economy, and reducing the role of the state. Import tariffs and taxes were simplified and reduced, while export taxes were eliminated except on peanuts and phosphates. Domestic markets for goods and services were substantially liberalized, regulations were eliminated and multiple public enterprises were privatized. IN 1986 the economic reforms affecting the industrial sector were consolidated in a New Industrial Policy (NPI). The NPI contained policy actions aimed at: reduced protection for domestic industry, export promotion, promotion of investments and improvement of the business environment. The investment code was revised, an industrial restructuring fund was created, and assistance and advice provided to investors was expanded. However, these measures were adopted during a period of persistent appreciation of the CFA franc. In 1994 the CFA franc was devalued and the WAEMU customs union launched. After the devaluation the Senegalese industrial sector experienced a modest recovery. Between 1995 and 2005 industrial production grew at an annual average rate of 3.8 percent.

In Tanzania the shilling had become badly overvalued by the early 1980s, and chronic shortages of foreign exchange and imported intermediate inputs were adversely affecting industrial performance. The government turned to the international financial institutions. An Economic Recovery Program (ERP) was adopted in the mid-1980s with the twin objectives of restoring macroeconomic economic stability and accelerating structural reforms. Trade reforms included devaluing the exchange rate, adjusting tariffs, and liberalizing internal trade. The ERP also contained reforms in agricultural policy, monetary, credit and financial policies, civil service reform, social services reform, restructuring of the parastatal sector, and privatization. The structural adjustment period in Tanzania was marked by a sharp decline in public sector manufacturing. Publicly owned textile firms came under intense pressure. Import competition, lack of technical expertise and the shortage of working capital resulted in most government-owned mills operating at as little as 10 per cent of capacity. This trend continued until the late 1990s when most state-owned textile mills were shut down awaiting privatization.

Extensive trade and exchange rate reforms began in Uganda in 1987. Following an initial 77 percent devaluation, the shilling was adjusted periodically through 1989 and the parallel-market premium steadily declined. At the end of 1993, the exchange system was unified. Import liberalization was fairly rapid, beginning with the dismantling of import licenses. There were several rounds of tariff reforms aimed at rationalizing the tariff structure. Uganda's development priorities for the 1990s emphasized deregulation, liberalization and reducing the role of the state the economy. The Uganda Investment Code of 1991 established the Uganda Investment Authority. A key objective of the new law was to create a one-stop center for the promotion of investments. Despite the reforms, the manufacturing sector played only a peripheral role in Uganda's growth. The share of manufacturing in GDP increased from 6.3 per cent in 1982 to 8.4 per cent in 1997, but declined thereafter to about 7 per cent in 2000.

3.3 Structural Adjustment without Structural Change – A Short-lived Recovery for Industry

Perhaps no episode in Africa's contemporary economic history raises as much debate as the structural adjustment period. The poor growth outcomes in Africa in the 1980s and 1990s caused considerable blame to be laid at the doorstep of structural adjustment. Critics argue that that adjustment loans were ineffective at changing economic policies (Easterly, 2005, 2009). Nevertheless, economic policies improved in Africa during the era of structural adjustment and African governments corrected some major distortions. According to one estimate, the median African currency was 82 percent overvalued in PPP terms in 1980. Between 1980 and 2000, there was a steady trend towards real devaluation of the exchange rate in most countries (including a major devaluation of the French-supervised CFA Franc in 1994). By the early 1990s, the currency in the median African country was at PPP parity, or even undervalued (Easterly, 2009). The devaluation of official exchange rates also sharply reduced the high black market premia on foreign exchange. The overall movement towards correcting other macroeconomic distortions – such as the fiscal deficit and interest rate liberalization – was positive but not quite as far reaching as exchange rate reform (Easterly, 2005).

One interpretation is that the influence of the IMF and World Bank was important in convincing countries to change their policies, but that the policy choices were not a direct consequence of structural adjustment loans themselves (Easterly, 2005). Seen in the larger context of the changing consensus on what constituted appropriate development policies, it is not surprising that governments in Africa came to regard the policies of the post-independence period

as excessively statist. The decline in industry – and in particular manufacturing – occurred in virtually every country before structural reforms were undertaken. Indeed, the need to respond to a shortfall in manufacturing production was often one of the motivations for governments undertake reforms.

The evidence is remarkably consistent with respect to industrial development. Across the continent governments liberalized trade, engaged in some deregulation of the domestic market, attempted to restructure state enterprises and finally turned to privatization. The early liberalizations of the foreign exchange market and the adjustment of the exchange rate provided a temporary stimulus to industrial production, as firms increased capacity utilization that had been heavily constrained by lack of imported intermediates and capital goods. The recovery of manufacturing was short lived, however. Increased competitive pressure from imports and rising production costs due to macroeconomic reforms in the foreign exchange and financial markets put considerable pressure on both state and private enterprises, alike.

Industry in Africa left the structural adjustment period in more or less the same position as it had begun it. Africa's share of manufacturing in GDP in 2000 was less than one half of the average for all developing countries. Manufacturing output per capita was about one third of the global developing country average. Per capita manufactured exports were less than 10 per cent of the developing country average. The region had low levels of manufactured exports in total exports and of medium and high technology goods in manufactured exports, and these measures had changed little since the 1990s (UNIDO, 2009). Structural adjustment had taken place without producing structural change.

4 CONSOLIDATION AND NEW DIRECTIONS (2000 TO PRESENT)

Africa entered the 21st Century in substantially better macroeconomic shape than it had been in the last decades of the 20th. By 2000 the stabilization programs in most countries had restored unified and appropriately valued exchange rates. Fiscal deficits were coming under control and inflation was beginning to subside. The region began to experience its first positive per capita income growth around 1995, a trend that would accelerate through the first decade of the 2000s. By 2010 it had become commonplace to refer to Africa's growth "turn-around", and most African governments began to develop national visions that called for achieving middle income status by about 2025. There is little evidence that significant structural change underpinned the growth turn-around (Arbache and Page, 2008; de Vries, Timmer and de Vries, 2013). The region's

growth after 1995 was driven primarily by new mineral discoveries, rising commodity prices and substantially improved economic policy (Arbache and Page, 2009).

Improved economic performance and increasing criticism of the IFIs approach to structural reform led to a retreat from adjustment lending. In late 1999, the World Bank and the IMF launched a new approach to the provision of concessional assistance to low-income countries. Governments would prepare Poverty Reduction Strategy Papers (PRSPs). As described by the IFIs, PRSPs would be "nationally owned" and provide the foundation for external assistance, as well as debt relief, by the World Bank and the IMF under the Heavily Indebted Poor Countries–HIPC—Initiative. The stress on national ownership derived from World Bank sponsored research that indicated that policy reform programs, however well designed were unlikely to be sustainable, or even implemented, without country ownership of the program, underpinned by a substantial degree of domestic consensus (Collier and Dollar 1998; Devarajan and Dollar 2001).

In principle the IFIs were returning control over economic policy making to national authorities in Africa. The backlash against "one-size-fits-all" structural adjustment coincided with a loss of confidence among academic researchers that they could identify the policy actions that would raise growth (Easterly, 2009). The World Bank appeared to absorb this lack of certitude writing in a review of lessons of economic growth in the 1990s that: "different policies can yield the same result, and the same policy can yield different results" (World Bank, 2005b). The Bank followed up by sponsoring a Growth Commission, whose final report appeared in May 2008, and contained a similar conclusion: "It is hard to know how the economy will respond to a policy, and the right answer in the present moment may not apply in the future" (Commission on Growth and Development 2008, p. 29).

The IFIs were less willing to entertain uncertainty with respect to industrial policy. The same Growth Commission in its review of export promotion and industrial policy wrote: "All of the sustained, high-growth cases prospered by serving global markets. The crucial role of exports in their success is not much disputed. But the role of export promotion is. Many of them tried a variety of policies to encourage investment in the export sectors in the early stages of their development, and several of these measures would qualify as industrial policies... Even though most of the high-growth successful economies tried industrial policies, so did a lot of failures. Nor do we know the counterfactual: whether the high-growth cases would have succeeded even without targeted incentives"



Jamaa el Fna market square, Marrakesh, Morocco, North Africa. Famous square and market place © 2017. Shutterstock images

(Commission on Growth and Development, 2008; p. 48).

But the Commissioners did not close the door entirely writing: “If an economy is failing to diversify its exports and failing to generate productive jobs in new industries, governments do look for ways to try to jump-start the process, and they should” (Commission on Growth and Development, 2008; p. 49). They went on to argue that such efforts should adhere to three disciplines. First, they should be temporary. Second, they should be evaluated critically and abandoned quickly if they are not producing the desired results. And, third, while policies could be biased in favor of exports as a whole, they should be agnostic about particular industries.

4.1 Consolidating Reform -- the Investment Climate

Operationally the IFIs resolved the tension between ceding space to national ownership, uncertainty about drivers of growth and skepticism over industrial policy by focusing on the “investment climate” – the policy, institutional and physical environment within which firms operated. Nicholas Stern, the World Bank Chief

Economist in the early 2000s, made the investment climate an area of focus for the World Bank Group. Stern argued that the investment climate included three main aspects: (i) macroeconomic stability and openness; (ii) good governance and strong institutions including bureaucratic efficiency, the strength of financial institutions, the rule of law, control of corruption and crime, regulatory quality, the effectiveness of public services, and the quality of the labor force; and (iii) the quality of infrastructure (Stern 2001, 2002). Investment climate programs could, therefore, consolidate the macroeconomic gains of the structural adjustment period, strengthen policy and institutional reforms and allow some space for governments to set new priorities in public expenditure, at least in the areas of infrastructure and education without treading too close to the slippery slope of industrial policy.

The World Bank’s flagship *World Development Report, 2005* articulated a similar definition (World Bank, 2005a). Investment climate reform became a “product” of the World Bank Group – and often through

the donor groups associated with the PRSP process the broader aid industry – in Africa. To encourage national ownership diagnostic work – in the form of Investment Climate Assessments – would be carried out. Agreed investment climate reforms would then be supported by freestanding operations or incorporated as components into the newly created *Poverty Reduction and Growth Facilities* of the IMF and *Poverty Reduction Support Credits* of the World Bank. In the period since 2000 the World Bank and International Finance Corporation (IFC) have focused more investment climate operations in Africa (about 30 percent of the interventions for both institutions) than in any other region. While at a diagnostic level assessments of the investment climate have been fairly inclusive, operations have been far narrower in scope. The investment climate reform agenda has centered on economy-wide reforms in trade, regulatory, and labor market policies designed to further reduce the role of government in economic management.⁴

4.2 Some New Directions

Some African governments have used the policy space created by the new emphasis on “national ownership” to innovate in terms of industrial policy. While in virtually all cases these innovations fall far short of “picking winners” through selective interventions at the industry or firm level, they do represent a level of government engagement and activism in the industrial sector that was absent under adjustment programs. Four areas in which countries have moved in new directions stand out: promoting exports, targeting sectors, linking industry to natural resources, and engaging the private sector.

Promoting Exports

With the exception of Mauritius, African governments have largely failed to pursue effective, systematic efforts to promote non-traditional exports. There is some indication, however, that things may be changing. Since the turn of the century a number of economies have adopted more activist approaches to export promotion. In 1998 the Ethiopian government launched a strategy aimed at promoting high value agricultural (horticulture products and meat) and labor-intensive manufactured exports (clothing, textile, leather and leather products). The flower industry and some historically import-substituting industries (such as metal and engineering, chemicals and pharmaceuticals) were added in the 2000s. A National Export Development Committee chaired by the prime minister sets export and productivity targets. As instruments the government has provided extensive support programs that

include financial incentives, capacity building, cluster development and direct public investment. Kenya’s *Vision 2030* emphasizes manufactured export growth. The focus on exports has resulted in new efforts to promote special economic zones and industrial parks, more vigorous export promotion, and liberalization of export incentives.

Africa’s Special Economic Zones do not have a good track record. A recent survey finds that they lack the minimum institutional and physical infrastructure to be attractive to global investors (Farole, 2011). Now, several countries are giving Export Processing Zones (EPZs) another try. In Ghana EPZs have been developed at Tema and Sekondi. Currently, about 300 enterprises operate in Ghana’s free zone enclaves. Manufacturing firms are involved in food processing, wood and veneer processing, processing of shea nuts/oil seeds, lubricants and biofuels, garments, and manufacture of food processing machines and spare parts. The zones also host such tradable services as data processing, telecommunication, and software development. In an effort to encourage the development of domestic value chains linked to the export sector the Tema zone is being developed into a multipurpose industrial park to provide non-free zone investors access to the industrial site. Nigeria has approximately 25 free trade zones licensed by the federal government, but fewer than 13 of these are currently operational. An Export Processing Zones (EPZs) Act was passed in Tanzania in 2002 to attract and promote investments for export-led industrialization. The Mozambique government has created several export processing and rapid development zones.

Targeting Sectors

Planning – at least in the indicative sense of signaling government’s interest in the development of new industrial activities – appears to be making something of a comeback in Africa. Most of the region’s strategy and planning documents describe a range of instruments intended to encourage private investment in targeted sectors. What is unclear is the extent of private sector interest and the effectiveness with which governments will implement the strategies. Ethiopia has assigned a strong role to the state in providing direct support to and coordinating and guiding private investment in textiles and garments, meat, leather and leather products, other agro-processing industries (e.g. sugar and sugar-related industries), and construction. Ghana’s national industrial policy includes a number of highly sector-specific objectives, for example: establishment of manufacturing enterprises to process agricultural produce, especially beans, fruits

⁴ The central metric of many investment climate operations has become the World Bank *Doing Business* indicators. Seven of the ten *Doing Business* indicators “presume that lessening regulation is always desirable whether a country starts with a little or a lot of regulation” (World Bank, 2008b; p. xv).

and shea nuts, rejuvenation of the textile industry, exploitation of the limestone deposits in northern Ghana for the production of cement for industry, utilization of the country's clay deposits for the production of bricks and other building materials, and rehabilitation of abandoned but viable manufacturing enterprises, including the jute factory, tomato cannery, gold refinery and ceramics production. A prominent feature of Mozambique's industrialization strategy has been the promotion of large mining, manufacturing and energy projects. These are the so-called "mega-projects" such as Kenmare, a US\$460 million heavy sands extraction and exporting investment, Sasol, a US\$ 1.0 billion natural gas extraction and exporting operation, Vale, (US\$1.26 billion) and Rio Tinto (US\$ 849 million) coal extraction and exporting investments and Mozal, a US\$ 2.3 billion aluminum smelter. The mega-projects have been controversial. Many have made little contribution public revenues and have a low degree of integration with the rest of the economy. On the other hand the projects have increased Mozambique's visibility to international investors and have exposed local FDI promotion and regulatory institutions to large-scale foreign investors. In Senegal the Accelerated Growth Strategy calls for the promotion of sectors such as horticulture, agro-industry, aquaculture, telecommunications and tourism and for improving the performance improvement of fisheries and textiles through a competitiveness cluster approach. The Tanzania Integrated Industrial Development Strategy 2025 targeted six subsectors: agro-processing, textiles, leather, fertilizer and chemicals, light machinery and iron and steel.

Linking Industry to Natural Resources

Since 2000, such previously non-resource dependent economies as Ghana, Kenya, Mozambique, Tanzania and Uganda have discovered significant hydrocarbon reserves. Not surprisingly, these governments see promoting linkages between domestic firms and foreign resource-extractive investors as a mechanism for industrial development. There is, however, a strong temptation to use blunt instruments, such as local content legislation or contractual obligations in the resource extraction agreement to broker value chain relationships. Rules of this kind are too easily circumvented, and may generate a bias in the supplier base towards those activities that contribute little to the development of the host country's industrial capabilities (Sutton and Olomi, 2013).

One innovation that some resource producers have attempted is to develop special economic zones linked to the resource industry. In Ghana for example the industrial development strategy calls for establishment of new and emerging industries such as

petrochemicals, fertilizer and LPG cylinder production linked to the new oil and gas industry. The Shama EPZ, situated in Ghana's Western Region, is an industrial park targeted to the petroleum-petrochemical sector. The zone provides investment support to a downstream refinery, distribution, transit and supply chain business products (plastics and jellies) intended for export. It also offers development and capacity-building services for employers and employees. The zone provides land for tank farms, storage yards for logistics and haulage contractors, manufacturing of chemical inputs and accessories for the petroleum industry. The Sekondi EPZ is to be developed into an integrated industrial-mineral processing zone. In Nigeria the oil and gas export free zone act of 1996 established an oil and gas free zone authority to manage, control, and coordinate activities around the ports of Onne (near Port Harcourt), Calabar, and Warri. Incentives to encourage investments in the region include: no personal income tax, 100 per cent repatriation of capital and profit, and no pre-shipment inspection for goods imported into the free zone. Tanzania has proposed using infrastructure investments linked to the extraction of natural resources for the development of "growth corridors".

Engaging the Private Sector

Governments are increasingly learning that the conduct of industrial policy is critical for its success. Close coordination between the public and private sectors—both to assist in the design of appropriate interventions and to provide feedback on the implementation of policy initiatives—is needed to identify the policy changes which offer the greatest scope for industrial growth (Rodrik, 2007; Harrison and Rodriguez-Claire, 2009). The authors of *Can Africa Claim the 21st Century?* recognized that the transition from stabilization and structural adjustment to more sustained private sector-led industrialization would require a new approach to business-government coordination. In 2000 they wrote "Underlying many of these actions [needed to promote efficient investment] are the relations between business and government and between labor and government. Too few governments have forged a supportive and consultative relationship with the private sector—one in which the government is accountable for service standards, and business for performance" (World Bank, 2000; p. 37). The massive literature on rent seeking and government failures on the other hand suggests that in many cases a close relationship between business and government can lead to inappropriate policy choices due to capture.⁵ Managing the tension between close coordination and capture is critical to the success of any attempt to engage the private sector.

⁵ A balanced review of the relevance of this literature is contained in the report of the Commission on Growth and Development (2008).

Since 2000 Africa has gained some experience—both positive and negative—with efforts to design institutions to foster business-government communication and problem solving. One attempt at close coordination came in the form of Presidential Investors' Advisory Councils (PIACs). These were launched by the Presidents of Ghana, Tanzania and Senegal in 2002 and Uganda in 2004.⁶ The Councils were set up on the advice of the President of the World Bank and the Managing Director of the International Monetary Fund, following their joint visit to Africa in 2001. They were intended to be a direct channel for dialogue between investors and political leaders—at the highest possible level—to “identify obstacles to investment and focus on a limited number of issues, to generate concrete recommendations for action and/or further analysis” (IMF, 2003).

The Councils had some early success in terms of fast tracking existing reform proposals and initiating new reforms, in part because they created an “atmosphere of discipline and pressure for action in the face of government inertia” that no other local mechanism for private sector development had come close to achieving (World Bank, 2005). By 2009 substantial differences in the performance had emerged. The council in Uganda was performing well in the assessment of stakeholders but the council in Ghana had failed to meet for two and a half years.

There were a number of common problems. The most significant was limited government implementation of Council decisions. A second major issue was the fact that participation from the private sector was dominated by representatives from a fairly small number of large firms, and the role and impact of local business associations was unclear. Most importantly, both government and business expressed frustration that the Councils were not coming to grips with the critical constraints to private investment; they had become “chat shops”. One reason for the inability of the Councils to address constraints was that their agenda was not set by business and government; it was set by the World Bank. The Councils had been captured, not by domestic vested interests, but by the aid industry (Page, 2013).

By way of contrast, in Kenya which did not have a PIAC stronger communication between the government and the private sector — particularly through the Kenya Association of Manufacturers — has been catalytic in increasing government interest in addressing problems facing manufacturers. Increasingly the government involves the private sector in the budget process, as well in institutions responsible for prioritizing critical areas

where the government should invest in improving the business environment.

Perhaps the best-known example of close coordination in Africa is in the Ethiopian cut flower industry. Ethiopia was a relatively late entrant into East Africa's cut flower export industry, but it achieved notable success. Government action in the industry's early days contributed substantially to its ability to break into global markets. Monthly meetings, involving representatives of the firms then involved took place with both the Minister of Industry and the Prime Minister present. Firms were free to identify barriers to their growth and development, and action points were agreed. The action points led to prompt and effective action. Implementation of agreed actions was monitored in succeeding meetings, and a public record of actions taken by Government was available to all firms (Gebreeyesus and Iizuka, 2010).

Other leading horticulture exporting countries in Africa have also successfully established mechanisms for cooperatively developing the industry, normally in partnership with government. Examples include the Horticultural Crops Development Authority and Fresh Produce Exporters Association in Kenya, the Zambia Export Growers Association and the Horticultural Promotion Council in Zimbabwe. These institutional structures allow shared facilities—for example cold stores and testing laboratories—to be developed and provide a forum for setting industry standards.

4.3 Country Experiences in the New Century

Ethiopia formulated a new Industrial Development Strategy in 2003 that recognized the critical role of the private sector as an engine of industrialization. Between 2000 and 2010, state ownership of the manufacturing sector fell from 25.7 to 6.4 per cent of establishments and from 86.25 per cent to 25.67 per cent of employment. The ideas contained in the strategy for the development of the private sector, are quite conventional — macroeconomic stability, financial access, dependable infrastructure, and skilled and effective human resources. Where Ethiopia has departed from the received wisdom is in assigning a strong role to the state in providing direct support to and coordinating and guiding private investment. The strategy makes a distinction between ‘rent-seeking’ and ‘developmental’ capitalists and emphasized the need to identify and promote the latter. The number of establishments in the formal manufacturing sector has tripled in the last decade. Industrial productivity has grown substantially and output growth averaged more than 10 percent over 2002-2010.

6 Other PIACs were set up in Mali, Mauritania and Benin.

Ghana's industrialization strategy since 2000 has focused on private sector-led industrialization. Investment climate reforms — macroeconomic policies, trade policies and reforms to the regulatory framework — feature prominently. Sector specific initiatives in industry are aimed at promoting agro-processing, facilitating the development of commercially viable export and domestic market-oriented enterprises in rural areas, improving the competitiveness of domestic industrial products, promoting industrial subcontracting and promoting the development of the crafts industry for export. The response of the sector has been tepid. Between 2000 and 2005 manufacturing growth accelerated from 3.7 to 5.0 percent, but fell back to an average of only 2.6 percent per year between 2005 and 2010.

The Poverty Reduction Strategy Paper, the program for Economic Recovery for Wealth Creation, and Kenya Vision 2030 define Kenya's approach to industrialization. Between 2004 and 2007 investment climate reforms were undertaken to improve power supply, increase the supply of agricultural products for agro processing, and introduce tax reforms. There was also a focus on improving the overall regulatory climate, including the rationalization of business licenses. The Jubilee government, which came to power in March 2013, has established a Ministry of Industrialization to signal stronger political commitment to industrial development. Industrial performance has improved somewhat in Kenya since 2000. The average annual growth rate of real GDP in the manufacturing sector accelerated to 3.8 percent in the period 2000-2007 from 2.5 percent during 1990-1999. Manufacturing has diversified beyond textiles, food processing and metal industries into petroleum products, rubber and plastics manufacturing, paper and printing and construction products, particularly cement.

Beginning in the mid-1990s Mauritius' export strategy came under severe stress from rising wages and the phasing out of the Multi Fiber Agreement. Many Asian-based investors left when their tax holidays lapsed. In response the Mauritius Export Development and Investment Authority increased efforts to find new markets and new investors for the EPZ. The Mauritius Standards Bureau and the Industrial and Vocational Training Board were very responsive to the needs of the textile and clothing sector, and the University of Mauritius became involved in developing skills and technology for clothing. Computerized sewing and stitching machines, backed by rigorous quality systems like ISO 9000, became a priority for most companies. A Technology Diffusion Scheme provided grants to firms that wanted to procure technical services to improve productivity, quality, and design and promote quality assurance standards and systems in garments. Mauritian textile and clothing exports grew 25% between 2005 and 2012 to reach \$850 million.

In 2007 Mozambique adopted a new Industrial Policy and Strategy. A significant role was assigned to the public sector in promoting investment, licensing private investors to operate, and ensuring joint ventures with local investors. A number of institutional innovations were implemented to encourage private investment, including creating a one-stop electronic window for clearing imports, an Investment Promotion Centre, and an Institute for the Promotion of Micro, Small and Medium Enterprises (IPEME). Eight priority areas of industry were flagged: food, furniture, construction materials, recycling, mechanical engineering, metalworking, electrical engineering and chemistry. Mozambique's economy has been growing at around 7 per cent per year since the end of the war in 1992, but the manufacturing sector has been growing at a much slower pace; over the last decade industrial growth has averaged about 3 per cent per year.

Nigeria's approach to industrial development post-adjustment was summarized in the 2004 National Economic Empowerment and Development Strategy (NEEDS). The strategy was intended to diversify production and exports away from oil and mineral resources, make the industrial sector internationally competitive, reduce the role of the government in the direct production of goods and strengthen its role in regulation and export promotion. A Seven Point Agenda designed to strengthen the NEEDS was introduced in 2007. The emphasis under both was on the implementation of investment climate reforms. Government sought to liberalize imports gradually and to harmonize tariffs with the Economic Community of West African States (ECOWAS) common external tariff. It did, however reserve the right to use import levies and import prohibitions to protect local industries. Other investment climate initiatives were directed at developing critical infrastructure in power, transportation, natural gas distribution, and telecommunications, and at "wealth creation" through skills development and access to credit for small- and medium-sized businesses and the self-employed. While real GDP growth in Nigeria has averaged more than 7 per cent in 2009-2011, manufacturing has not kept pace. As a share of GDP it has declined to about 4 percent since 2003.

In Senegal a private sector development strategy was adopted in 1999 by agreement between the two major political parties. Implementation of this strategy began with the creation in 2000 of the Investment Promotion and Major Projects Agency and in 2001 of the Agency for the Development and Supervision of SMEs. The 2005 Accelerated Growth Strategy (SCA) set establishing a business environment consistent with international good practice as its principal objective. The SCA action plan also included development of special economic zones and other dedicated sites such as

enterprise incubators. The response of the industrial sector to the new initiatives has been lackluster. Industrial growth was 3.2 percent during 2006-2011, and the share of the formal modern sector in industrial value added has fallen.

Since the mid-1990s industry has found its way back onto the development agenda in Tanzania. In 1996 the government introduced a 25-year Sustainable Industrial Development Policy, which assigned priority to employment creation in industry and sought to strike an appropriate balance between import substitution and export orientation. In 1999 Tanzania adopted its *Development Vision 2025*, which further stressed the role of the industrial sector in long-term development. In 2010 the Integrated Industrial Development Strategy 2025 aimed at creating a competitive business environment, improving existing development corridors, concentrating infrastructure development on constraints to industrial growth and promoting agriculture-led industrialization. Manufacturing in Tanzania grew at an average rate of 7.1 per cent

between 2000 and 2004, and at 8.6 per cent during the years 2005-11, well above the overall 6.8 per cent average economic growth recorded in the five years to 2011. Growth of manufactured exports averaged 31 per cent per year during the period 2000-10.

Uganda has focused mainly on the investment climate. Its National Industrial Policy, published in 2008, seeks to boost private sector-led industrialization through such reforms as development of efficient and reliable infrastructure, promotion of entrepreneurship, and development of a skilled labor force. Policy initiatives included promoting Public-Private Partnerships, establishing Export Processing Zones, stimulating investment in export-oriented industries, undertaking cluster development and encouraging the use of locally available raw materials in value adding industrial processes. These priorities were reaffirmed in the most recent National Development Plan (2010/11–2014/15). Since 2000 manufacturing growth in Uganda has kept pace with overall economic growth, and the share of manufacturing in the economy



Morocco PADESFI (Financial sector development support program) 2014 © 2017. African Development Bank Group

has remained constant at about 7 percent of GDP. Manufactured exports as a share of total exports have increased continuously since 2000, rising from less than 5 percent of total exports to more than 25 percent. The recent improvement in export performance is largely the result of new market opportunities in the Democratic Republic of Congo, Sudan, and Rwanda.

4.4 Not Yet a Turning Point

Across Africa governments have continued to consolidate the gains in macroeconomic management and trade policy reform of the 1990s. The payoff in terms of overall growth for Africa's economies has been considerable. The region grew at around 4.6 percent per year during the last decade, exceeding the average for the rest of the developing world (excluding China) by about one percentage point.⁷ Per capita income has been rising steadily, and six of the world's 10 fastest-growing countries are in Africa. But, neither the widespread adoption of investment climate reforms, nor the new directions taken by some African governments appear to have reversed the four-decade decline in African manufacturing. Africa's share of manufacturing in GDP in 2010 was about 10 percent, less than one half of the average for all developing countries and approximately the same as in 1970.

Table 2 presents selected indicators of manufacturing performance for the period 1995-2010. The good news is that there appears to have been some acceleration in the growth rate of manufacturing after 2005. The manufacturing performance of Ethiopia, Tanzania and Uganda adds some anecdotal support to the region-wide averages. The bad news is that compared to all developing countries and to the least developed countries, Africa's manufacturing growth has been low and uneven. The region has performed somewhat better with respect to the growth of manufactured exports, particularly during 2000-2005. Since 2005, however, manufactured export growth appears to have collapsed. The region continues to have a very small share of manufactured exports in total exports relative to both developing countries as a whole and the least developed countries, and there has been no discernable trend.

Table 3 gives recent estimates of the sectoral distribution of output and employment for 11 African countries over the period 1990-2010.⁸ Such structural change as has taken place in Africa has been from agriculture to services. Agriculture's share of the economy has declined in terms of output and employment. Between 1990 and

2010 the share of the African work force employed in market services nearly doubled from 12.9 percent to 23.5 percent. Industry—and especially manufacturing—declined as a share of total output and employment. Africa has not yet reached a turning point in its industrial development.

5 CONCLUSIONS

The three eras of industrial policy in Africa – state-led import substitution, the Washington Consensus of the adjustment period, and the post-adjustment focus on the investment climate – are marked by a high degree of similarity across countries. In part this can be ascribed to the similar stages of industrial development of most African economies and to the prevailing thinking among development economists with respect to appropriate policies to promote industrial development. But it is also partly due to the significant role played by aid in policy making in Africa. The reforms of the adjustment period and the efforts to improve the investment climate of the past decade were largely undertaken in response to donor initiatives.

Both donors and African governments can look back on the reforms of the adjustment period with a degree of satisfaction. Greatly improved macroeconomic management and the opening of the region's economies to international competition were necessary steps for the efficient creation of industry. But it is apparent that industry in Africa has yet to turn the corner. Part of the responsibility for the poor response of industry in the post-adjustment period may rest with the design and implementation of investment climate reforms themselves. Of the range of investment climate reforms available, African governments – pushed by their development partners – have devoted too much attention to low impact but easily measured reforms of business regulations and have neglected two other major investment climate constraints, infrastructure and skills (Page, 2012).

For the vast majority of African countries the export market represents the only option for rapid growth of manufacturing. Africa is a latecomer to the global market in manufactured goods. Rising real wages in China may offer an opportunity to break into global markets in low-wage goods (UNIDO, 2009; Dinh et al, 2013), but to succeed African governments will need more effective programs of export promotion and more effective use of Special Economic Zones that is currently the case. With the exception of Mauritius

7 If South Africa is excluded the regional average is an even more impressive 5.2 per cent (World Bank, 2013).

8 Data underlying the table are drawn from the new Gronnengen Africa Sector Data Base. Available at <http://www.rug.nl/ggdc/productivity/10-sector/other-releases/africa-sector-database>

(and perhaps Ethiopia) African governments have not mounted a comprehensive set of policy and institutional initiatives, and investments aimed at rapid export growth.

The recent trend toward identifying priority sectors runs the risk of being dismissed as “picking winners”. Yet, governments pick winners every day through the budget and public investment. These decisions invariably favor some activities and penalize others.⁹ To the extent that priority sectors are those in which the economy has demonstrated industrial capabilities, using this information to provide a strategic orientation to public actions is sensible.¹⁰ The key questions are: how have the priorities been set and how will success be measured?

Natural resource discoveries offer a major opportunity. The development of supplier-purchaser relationships between domestic firms and resource-based foreign investors can be an important channel for increasing the capabilities of domestic firms. Brokering such marriages will require public action, but governments will need to avoid the temptation to take the easy option of local content rules and undertake the much harder work of building a tripartite partnership between foreign investors, domestic firms and the government.

The success of these and other industrial policy initiatives will ultimately depend on the ability of societies in Africa to develop effective business-government coordination. The experience of the Presidents Councils strongly suggests that off the shelf imports of institutions of close coordination from other settings is unlikely to be effective, and that donor driven initiatives ought to be avoided. This places the onus on African governments – as the governments of Ethiopia and Kenya have done – to develop home grown solutions.

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⁹ Rodrik (2007) makes a similar point.

¹⁰ Used in this way capabilities determine international competitiveness. See Sutton (2012) on this point.

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APPENDIX 1:

Table 1: Manufacturing Output Growth in Africa 1960-1980

Country Group	1960-1965	1965-1970	1970-1975	1975-1980
Low Income Countries	7.1	9.0	2.1	0.1
Middle Income Countries	7.5	7.6	7.7	4.2
Total	7.3	9.3	5.3	4.4

Note: Annual percentage at constant 1970 prices

Source: Meier and Steel (1989)

Table 2: Selected Indicators of Manufacturing Performance 1995-2010

Country Group	1960-1965	1965-1970	1970-1975
Growth of Manufacturing Value Added			
Africa	3.7	3.5	4.6
Developing Countries	6.6	6.2	7.1
Least Developed Countries	5.5	6.6	7.1
Growth of Manufactured Exports			
Africa	10.2	19.8	0.9
Developing Countries	9.1	14.0	9.0
Least Developed Countries	7.4	45.7	na
Share of Manufactured Exports in Total Exports in Total Exports			
Africa	25.1	33.7	26.2
Developing Countries	76.5	77.3	78.0
Least Developed Countries	64.2	56.0	41.0

Source: UNIDO Industry Database

Notes: Average annual growth at constant 2000 prices. South Africa excluded from Africa regional data.



Morocco PADESFI (Financial sector development support program) 2014 © 2017. African Development Bank Group



CHAPTER 4

SUB-SAHARAN
AFRICA'S
MANUFACTURING
SECTOR: BUILDING
COMPLEXITY

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1 INTRODUCTION

Prior to 2000, there was widespread pessimism regarding Africa's economic growth prospects. An over-reliance on mineral exports, civil war and chronic corruption had ruined many of Africa's economies, culminating in *The Economist* labelling it the 'hopeless continent' (*The Economist*, 2000). Since the turn of the millennium, however, the narrative has changed. Pessimism has changed to optimism, buoyed by the growth of an African middle class (Shimeles & Ncube, 2015) and increasing foreign direct investment, which reached \$60 billion in 2013—five times its 2000 level (Diop et al. 2015).

The optimism, however, has been tempered by unemployment—especially among young people—that has accompanied the high levels of economic growth. Between 2000 and 2008, the African working age population (15 – 64 years) increased from 443 million to 550 million, but only 73 million jobs were created over the same period (OECD, 2012; Sparreboom & Albee, 2011). The youth only obtained 16 million or 22 percent of those jobs (Sparreboom & Albee, 2011). Indeed, the SSA youth unemployment rate only decreased by 1 percent over the past 20 years—from 13.4 percent (1991 – 2000) to 12.3 percent (2001 – 2012) (ILO, 2014). In effect, the high growth rates have not generated a sufficient quantum of jobs to match the expansion in the labour force. The challenge is further exacerbated by estimates which state that each year between 2015 and 2035, 500 000 people in sub-Saharan Africa (SSA) will turn 15 (Filmer & Fox, 2014).

In the context of a growing labour force, there has been debate over the prospects of Africa following the economic footsteps of

East and South Asia, and pursuing a form of manufacturing-led structural transformation, and thereby creating jobs for a young and growing labour force (McMillan et al., 2014; Rodrik, 2014; Page, 2012). This paper adds to this debate, which has typically viewed manufacturing at the aggregate level, by providing a more granular product-level analysis of SSA's evolving manufacturing sector, with the Asian experience serving as a counterpoint. The analysis is aided by the tools of complexity analysis, specifically those derived from the Atlas of Economic Complexity (see Hausmann et al., 2014).

2 SUB-SAHARAN AFRICA'S DEMOGRAPHIC DIVIDEND AND STRUCTURAL TRANSFORMATION

Over the next century, sub-Saharan Africa (SSA) is predicted to account for the majority share of world population growth. The world population is expected to grow by 3.9 billion by 2100, of which 2.9 billion or 75 percent will be from SSA (see Table 1).¹ As a result, SSA's share of the world's population will increase from 14 to 35 percent. Africa's working age population will increase by 2 billion while many other continents will see their working age population shrink as a result of aging populations (Bhorat, Naidoo and Ewinyu, 2017).² Nearly 40 percent of the world's working age population is expected to reside in Africa by 2100 – up from 10 percent in 2015.

The predicted growth of Africa's population on aggregate and, importantly, the growth in the working age population, mask considerable country level heterogeneity across the continent. Figure 4.1 shows the degree to which SSA countries have

1 All projections beyond 2015 use the UN Population Division's Medium Variant projections.

2 Working age population is defined as individuals aged between 15 and 64 years.

completed their demographic transition. Specifically, we compare the share of the working age population in 2015 (the rectangular base of the arrow) to the predicted peak share of the working age population (the top point of the arrow) for each country.

Three countries (Mauritius, Seychelles and Réunion) have already hit the peak of their share of the working age population. In fact, between now and 2100, the proportion of the working age population in these three countries is expected to decline. Another group of five countries (Cabo Verde, South Africa, Botswana, Djibouti and Namibia) are relatively close to reaching their peak working age population. A third group of approximately 18 countries are expected to experience a rise in their working age population share of between 6 and 10 percentage points.

Finally, a fourth group, comprising 24 countries, is expecting a rise in the working age population share of between 11 and 18 percentage points. This group includes Nigeria, Ethiopia, the Democratic Republic of the Congo, and Tanzania, four of the top six most populous countries in Africa. Indeed, just ten SSA countries will account for nearly 70 percent of the population growth in the region (see Appendix Figure 1). Nigeria will experience an increase of 570 million, accounting for nearly a fifth of all SSA population growth. The DRC will see its population increase by 311 million or 10.5 percent of all SSA growth. The third major population driver in the region, Tanzania, will experience a six-fold increase in the size of its population from 53 to 299 million.

The rapid growth of Africa's working age population presents both opportunities and risks. A growing labour force is an opportunity to increase the productive capacity of a country and thereby generate economic growth and raise living standards—together with the promise of a large and growing consumer market. In contrast, a failure to utilise the economic potential of new jobseekers through

absorption in the labour market, will lead to rising unemployment and escalate the risk of social unrest. Ultimately, countries need to experience both economic growth and high levels of job creation to realize the dividend that comes with an expansion of the labour force. The region has experienced economic growth over the past two and a half decades. This is depicted in Figure 4.2. In the 1980s and 1990s, sub-Saharan Africa's GDP per capita was falling. When compared with other developing county blocs—such as East Asia and Latin America and the Caribbean—it was the worst performing region by some distance. However, since 2000, it has out-performed, not only Latin America and the Caribbean, but high income countries as well. The recent global downturn—caused by the 2007/2008 financial crisis—has, however, raised questions about the sustainability of Africa's recent growth performance.

In particular, concerns have been raised about the lack of structural transformation—'the reallocation of economic activity away from the least productive sectors of the economy to more productive ones' (OECD, 2013) —taking place across the region (McMillan & Rodrik, 2011; UNECA, 2014). Much of the growth has come from either large oil exporters (e.g. Nigeria) or countries that have experienced a large expansion of their services sector (e.g. Rwanda) (Rodrik, 2013).

In Figure 4.3 below, we provide an overview of the degree of structural transformation in SSA between 1975 and 2010.³ Figure 4.3 depicts this shift of employment across sectors varying in terms of productivity. This is done by plotting the productivity across ten sectors in 2010 against the change in employment within these sectors, over the period 1975 to 2010, for a sub-Saharan African regional aggregate. In essence, the graph is showing whether shifts in the structure of the economy, in terms of shifts in employment across sectors, have been toward productive or unproductive activities. A positively sloped fitted line is indicative of productivity-enhancing, and hence growth-inducing, structural change. Conversely, a negatively sloped

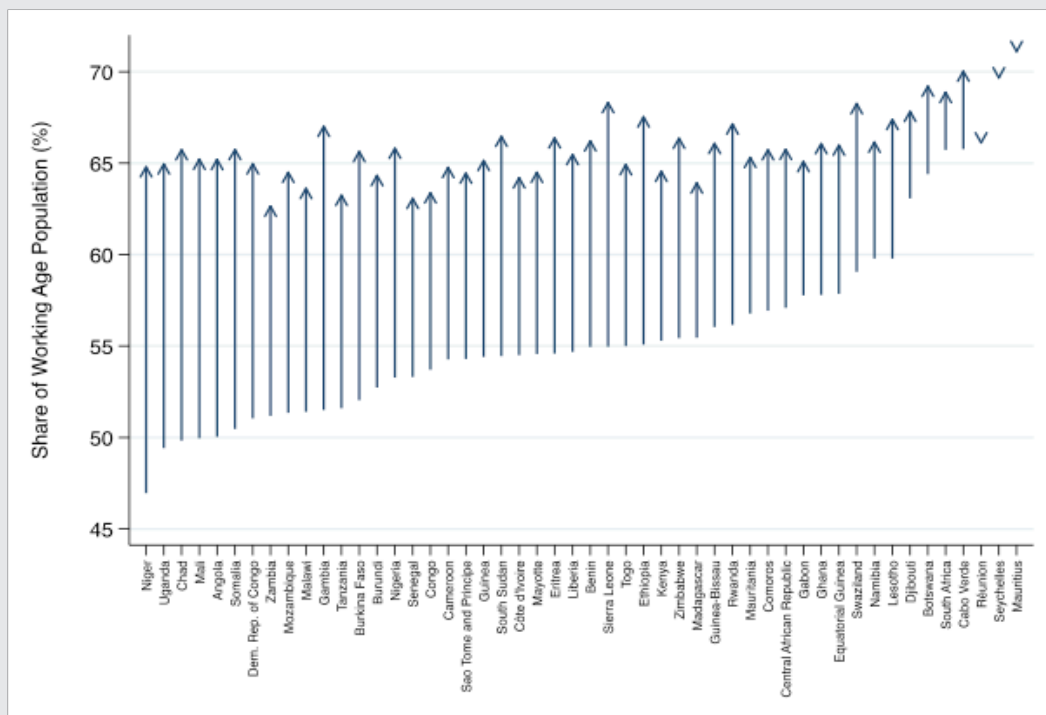
3 In Appendix Table 1, we report actual shares of employment for Africa and Asia between 1975 and 2010.

Table 4.1: World and Sub-Saharan African Population Projections, 2015 - 2100

	Total Population (Billion)			Working Age Population (Billion)		
	2015	2100	Change (%)	2015	2100	Change (%)
Sub-Saharan Africa	1.0	3.9	290	0.5	2.5	400
World	7.3	11.2	53	4.8	6.7	40
SSA Proportion (%)	13.7 %	34.8 %	-	10.4 %	37.3 %	-

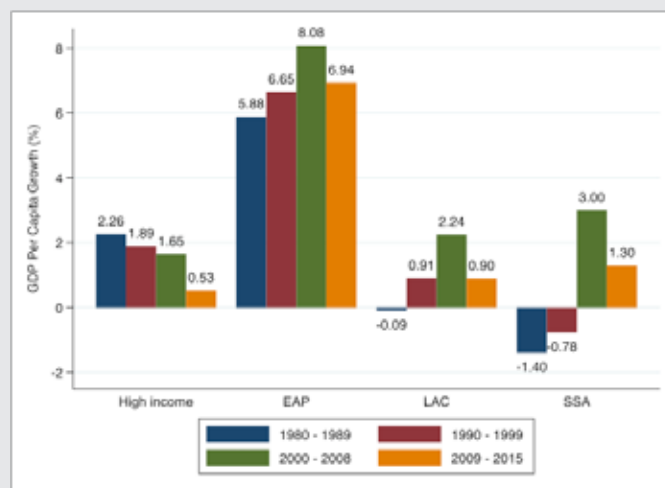
Source: Adapted from Drummond, Thakoor and Yu (2014) using the UN World Population database.

Figure 4.1: Current and Peak Share of the Working Age Population in Sub-Saharan Africa, 2015-2100



Source: Authors' calculations using the UN World Population Database.

Figure 4.2: GDP Per Capita by Region, 1980-2015



Source: Authors' calculations using World Development Indicators (2017).

Notes: EAP: East Asia and Pacific (excluding high-income countries); LAC: Latin America and the Caribbean (excluding high-income countries); sub-Saharan Africa (excluding high-income countries). List of countries included in Appendix Table 1, Table 2, Table 3 and Table 4.

fitted line is indicative of productivity-reducing, and hence growth-reducing, structural change.

Looking at Figure 4.3, there is evidence of growth inducing structural transformation in SSA over the period 1975 to 2010.⁴ While remaining the largest employer, the low productivity agriculture sector has incurred the highest employment losses over the 35-year period.

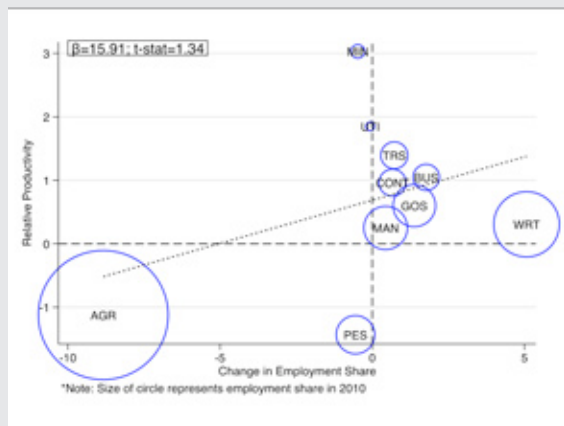
Employment levels in the high-productivity manufacturing sector have remained stagnant. The biggest beneficiaries of SSA's growth have evidently been services, with government, transport, business, and trade services increasing their share of employment over the period. Unfortunately, the most productive sectors (mining and

utilities) have not recorded employment growth. This is indicative of the high level of capital intensity associated with these industries. Ultimately then, the African growth experience over the last 35 years can, in general, be characterised as being manifest in a growth in capital-intensive resource- and energy-based industries—which in turn have not generated a sufficient number of jobs. In turn, Africa's manufacturing sector has stagnated in output and employment terms. The latter has been in an environment of an unproductive agriculture sector and an employment-intensive, urban-based informal retail sector.

On the other hand, the East and South Asian regional aggregate (now known as the Asian regional aggregate) illustrates the more

4 It must be noted that the estimated regression line, measuring the relationship between productivity and changes in employment share by sector, is not statistically significant.

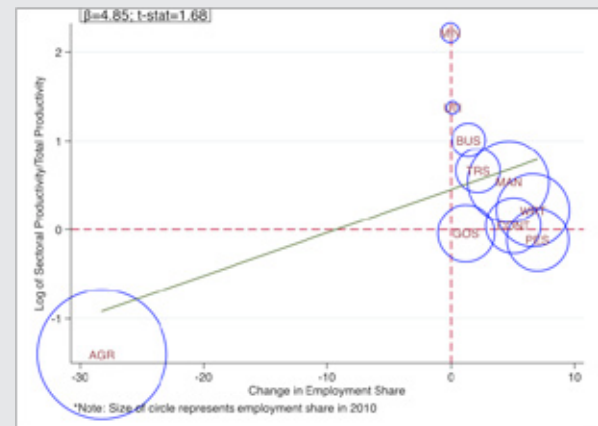
Figure 4.3: Sectoral Productivity and Employment Changes in Africa, 1975-2010



Source: Own calculations using Groningen Growth and Development Centre 10-sector database (see Timmer et al., 2014).

Notes: 1. African countries included: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, Tanzania and Zambia. 2. AGR = Agriculture; MIN = Mining; MAN = Manufacturing; UTI = Utilities; CONT = Construction; WRT = Trade Services; TRS = Transport Services; BUS = Business Services; GOS = Government Services; PES = Personal Services.

Figure 4.4: Sectoral Productivity and Employment Changes in Asia, 1975-2010



Source: Own calculations using Groningen Growth and Development Centre 10-sector database (see Timmer et al., 2014).

Notes: 1. Asian countries are comprised of East and South Asian countries, including: China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand. 2. AGR = Agriculture; MIN = Mining; MAN = Manufacturing; UTI = Utilities; CONT = Construction; WRT = Trade Services; TRS = Transport Services; BUS = Business Services; GOS = Government Services; PES = Personal Services. 2. The estimated regression line, measuring the relationship between productivity and changes in employment share by sector, is not statistically significant.

typical manufacturing-led pattern of structural transformation (see Figure 4.4 below). It is evident that employment has shifted from low productivity agricultural activities to higher productivity activities, particularly in manufacturing.

In the aggregate, Asia has seen a dramatic decline in agricultural employment—approximately 30 percent. However, as in SSA, agriculture remains the dominant source of employment. Services, while showing employment growth, is minor compared to that of SSA, although it is off a bigger base. The most significant difference between SSA and Asia is driven by the differential outcomes in the manufacturing sector. Not only is manufacturing relatively more productive in Asia than in SSA, it has grown substantially between 1975 and 2010, and has the second largest share of employment (15.8%) after agriculture (40.1%).⁵ This is consistent with the notion that manufacturing has been an engine of growth for the Asian region.

Comparing the SSA aggregate to the Asian aggregate, it is evident that both regions have experienced growth-inducing structural transformation over the period, but the nature of the transformation has been different. The Asian experience points to a shift from the low productivity agricultural sector to the high-productivity manufacturing sector. The SSA experience points to a shift from the low-productivity agricultural sector (although, to a lesser degree than in Asia) to services. In particular, a shift to wholesale and retail trade services, which is typically taking place within the informal sector. Therefore, in the context of a young and growing labour force in most countries in the SSA region, questions concerning where jobs are going to come from is front and centre in the policy debate.

Stagnation in the manufacturing sector is, however, not solely due to Africa-specific factors. Recent evidence indicates that it is becoming increasingly difficult to industrialize. Figure 4.5 indicates the income level peak manufacturing employment across various countries. The first wave of industrializers (notably, Great Britain, Sweden and Italy) witnessed peak manufacturing employment of about 30 percent of total employment. The next wave of industrialisation—mainly East Asian countries (e.g. South Korea)—saw peak manufacturing employment well below 30 percent. Finally, most Latin American and African countries began experiencing de-industrialisation when peak manufacturing employment was between 13 and 17 percent of total employment (e.g. Brazil; South Africa). Nigeria and Zambia both experienced

deindustrialisation before manufacturing even reached 10 percent of total employment.

Rodrik (2014, 2016) attributes this phenomenon mainly to trade and globalisation. As part of their membership of the World Trade Organization, developing countries were forced to liberalise many of their markets. At the time, many African countries had nascent manufacturing sectors and thus, when exposed to world markets, became importers of manufactured goods. Secondly, the relative decline in prices of manufactured goods in industrialized countries threatened the economic viability of manufacturing sectors, especially in countries where the manufacturing sector was not well established. In contrast, Asian countries were not subject to the same trends because of their comparative advantage in manufacturing.

It is indisputable that it has become harder to industrialize. When developed countries and Asia industrialized, they did so under protectionist regimes, which allowed them to build a significant manufacturing base (Rodrik, 2016). In contrast, SSA has had to compete in the world market with established manufacturing exporters. In addition, Asian exporters have successfully penetrated the domestic markets of SSA countries, making it even more challenging for these countries to build a productive manufacturing sector. Regardless of these hurdles, however, manufacturing remains the best hope for SSA to generate a large number of good jobs and reduce the prospects of political and social instability.

McMillan et al. (2014), Rodrik (2016) and others, provide insight into the extent to which African countries can industrialize and thereby create manufacturing jobs in the face of a growing labour force. These analyses, however, have sought to examine the evolution of the manufacturing sector across countries at the aggregate level, focusing on the manufacturing sector as a homogenous entity. In the following analysis, we attempt to provide product-level insights into the evolution of the manufacturing sector in SSA, with the East and South Asian region as a counterpoint. The expansion of the manufacturing sector is not simply the expansion of a single aggregate entity but rather an evolution of heterogeneous productive activities within this aggregate. We go on to argue that an evolving manufacturing sector is one that shifts production toward increasingly sophisticated forms manufacturing activity requiring combinations of embedded knowledge and capabilities, thereby ultimately building economic complexity. The aim is to

5 In comparison, the employment share in manufacturing and agriculture in 2010 in SSA were 6.6 and 58.9 percent, respectively.

provide more nuance to the existing debate by providing a more granular method of analysis.

3 EMPLOYMENT, MANUFACTURING AND INCREASING COMPLEXITY

In this section, we use economic complexity analytics to provide product-level insights into sub-Saharan Africa’s development path in comparison with that of the Eastern and Southern Asian regions. Specific emphasis is placed on the evolution of the manufacturing sector within these regions. The section starts by motivating for the link between a country’s level of economic complexity and the relative strength of its manufacturing sector. This is followed by a product-level comparative analysis of the Asian and sub-Saharan African region’s development trajectory with respect to their evolving manufacturing sectors. The East and South Asian region provides an example of a ‘manufacturing success story’, and thus acts as a useful counterpoint from which to compare the evolution

of manufacturing in SSA. The section concludes by examining how the evolving manufacturing sectors across these regions act as a source of employment.

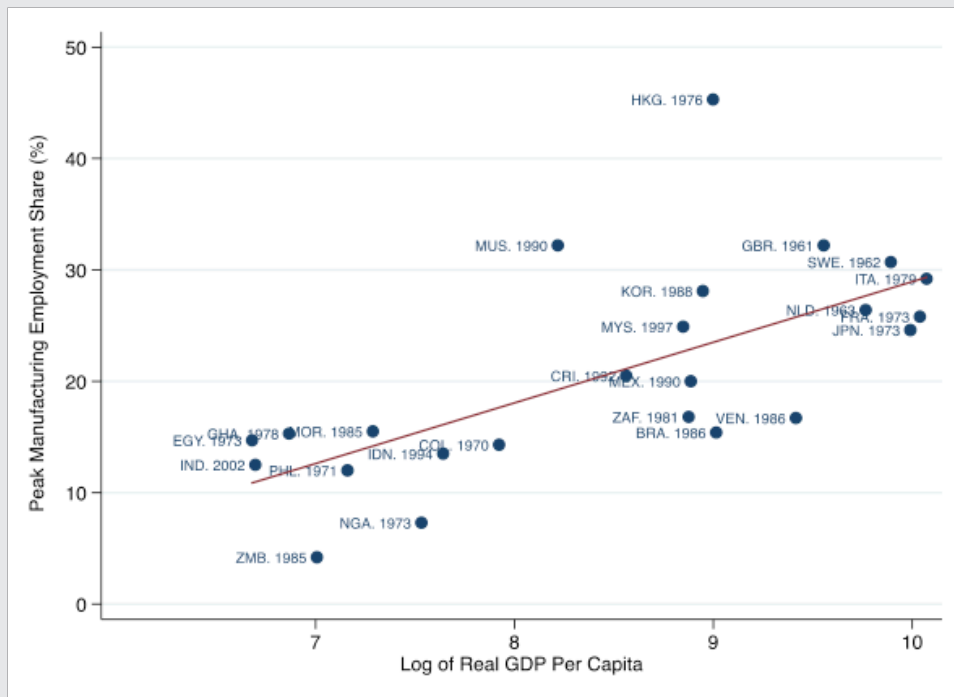
3.1 Conceptualizing Complexity and Connectedness

Economic Complexity

Hausmann et al. (2014) argue that the process of economic development involves the accumulation and mobilisation of productive knowledge, or capabilities. The amount of productive capabilities that a country is able to mobilize, is reflected in the diversity of firms that it has, the diversity of occupations that these firms require, and the level of interactions between these networks of firms. These productive capabilities are described as non-tradable networks of collective know-how, such as logistics, finance, supply and knowledge networks (Hidalgo et al. 2009). The accumulation and mobilisation of these productive capabilities is embodied in the measure of *economic complexity*, developed by (Hidalgo et al. 2009).⁶

6 It is worth mentioning that a number of other researchers, such as Tacchella et al. (2012), have developed alternative methods for measuring economic and product complexity. We employ the methodology outlined in the Atlas of Economic Complexity (<http://atlas.cid.harvard.edu>), developed by a team of researchers at the Centre of International Development (CID) at Harvard University.

Figure 4.5: GDP per capita at Peak Manufacturing Levels, By Country



Source: Own calculations using Groningen Growth and Development Centre 10-sector database (see Timmer et al., 2014).

In order to measure the productive knowledge or capabilities embedded in an country, Hidalgo et al. (2009) use international trade data to examine what products countries make, and from this, to infer their productive capabilities. Two components inform the construction of a measure of *economic complexity* for a country: Firstly, countries with individuals and firms that possess more productive knowledge can produce a more diverse set of products. Secondly, products that require large amounts of productive knowledge are only produced in a few countries where this knowledge is available. Therefore, the more diverse a country's export portfolio and the less ubiquitous the products that comprise its export portfolio, the more productive knowledge embedded in its economy.

Figure 4.6 provides an illustrative example on how the dual measures of diversity and ubiquity are used in the measurement of economic and product complexity. One observes that Holland has the most diverse export basket (five products), while Ghana has the least diverse export basket (one product). This provides the first iteration of productive capabilities data, which suggest that Holland has more productive capabilities than Ghana. One also observes that Holland exports all five products, but interestingly, it exports the two least ubiquitous products (X-ray machines and pharmaceuticals), suggesting in part some form of specialized capability in the production and export of these goods. Holland also exports

cream, cheese, and frozen fish, which are exported by Ghana and Argentina, and thus relatively more ubiquitous. This second iteration of information reinforces the first, and the combination of both the diversity and ubiquity measures, suggests that Holland has the most productive capabilities. The relative ubiquity of these products—cream, cheese and frozen fish—suggests that the productive capabilities embedded in them are common across the three countries. This is even truer in the case of frozen fish, which is produced in all three countries. However, only Holland can produce X-ray machines and pharmaceuticals—suggesting that the productive capabilities embedded in these products are relatively more specialized and specific to Holland.

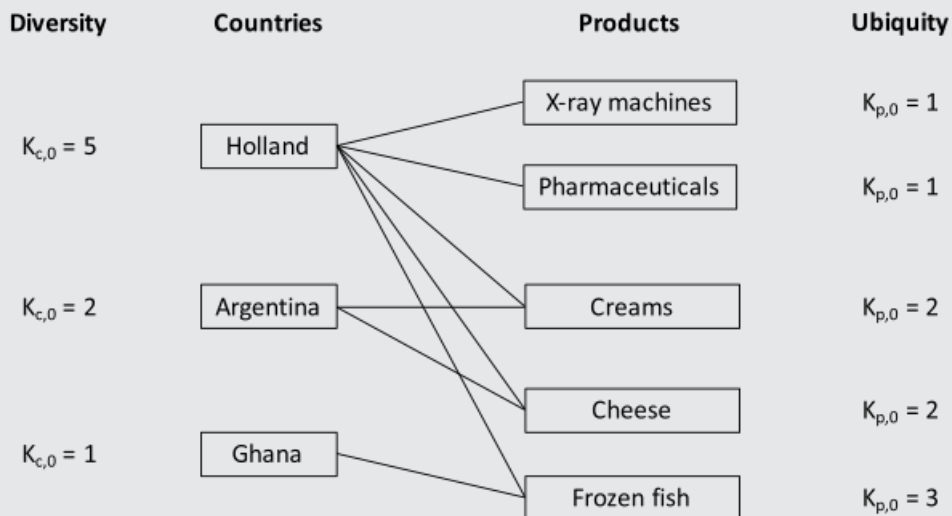
More formally, and informed by Hidalgo et al. (2009), using bilateral trade data - diversity and ubiquity are defined in the following equations:

$$Diversity = k_{c,0} = \sum_p M_{cp} \tag{1}$$

$$Ubiquity = k_{p,0} = \sum_c M_{cp} \tag{2}$$

Where M_{cp} is a matrix that is 1 if country c produces product p and 0 otherwise. Diversity and ubiquity are measured by summing over the rows and columns of the matrix, respectively. Hidalgo et al. (2009) employ an iterative calculation, the Method of Reflections, to

Figure 4.6: Example of Country-Product Network used in Method of Reflections



Source: Own calculations using Groningen Growth and Development Centre 10-sector database (see Timmer et al., 2014).

generate measures of complexity. Each iteration of the calculation corrects information from the previous iteration, until the process converges. In the case of countries, one calculates the average ubiquity of the products that each exports, the average diversity of the countries that make those products, and so forth. In the case of products, one calculates the average diversity of countries that export them, and the average ubiquity of the products that these countries make. Formally, this is expressed as:

$$k_{c,N} = \frac{1}{k_{c,0}} \sum_p M_{cp} \cdot k_{p,N-1} \quad (3)$$

$$k_{p,N} = \frac{1}{k_{p,0}} \sum_c M_{cp} \cdot k_{c,N-1} \quad (4)$$

Therefore, diversity is used to correct for information carried by ubiquity, and ubiquity is used to correct for information carried by diversity. Furthermore, ubiquity can be further corrected by taking information from diversity that has already been corrected for by ubiquity, and so on. This mathematical process converges after a few iterations, and generates measures of complexity for countries, *economic complexity*, and measures of complexity for products, *product complexity*.⁷ Formally, this is presented by manipulating equations (3) and (4) to arrive at:

$$k_{c,N} = \sum_{c'} \tilde{M}_{cc'} k_{c',N-2} \quad (5)$$

Where $\tilde{M}_{cc'}$ corresponds to the eigen vector capturing the largest eigen value in the system. Eigen values represent the measure of economic complexity. More formally, this is represented as:

$$ECI = \frac{\bar{K} - \langle \bar{K} \rangle}{stdev(\bar{K})} \quad (6)$$

In the equation, $\langle \rangle$ and *stdev* represent average and standard deviation, respectively. \bar{K} represents the eigen vector of $\tilde{M}_{cc'}$ associated with the second largest eigen value. This procedure allows for the generation of the measures of *economic complexity*, which measures the productive capabilities specific to each

country, and *product complexity*, which measures the productive capabilities needed to produce a product.⁸

Connectedness

The connectedness of a country's productive structure, measured as the *opportunity value* index, using the Atlas of Economic Complexity measures (Hausmann et al., 2014), provides a value of the new 'nearby' productive opportunities associated with a country's current export structure. Higher *opportunity value* indices indicate more connected productive structures or productive structures comprising products that are relatively proximate to a large number of products that a country currently does not produce. In terms of capabilities, this means that the capabilities embedded in this connected productive structure are relatively proximate to those needed for products that are not currently produced. Conversely, the capabilities embedded in a less connected productive structure are relatively distant from those needed for products that are not currently produced.⁹

Hausmann et al. (2014) show that increasingly complex products, typically manufactured products, are connected and proximate to more products than less complex primary products that are distant and less connected. Put differently, the capabilities needed to produce manufactured products are relatively similar to those needed to produce other manufactured products. The implication being that if a country already has an established manufacturing sector, it is better positioned to expand and diversify this sector than a country with a marginal manufacturing sector.

3.2 Economic Complexity and Manufacturing

Hidalgo et al. (2009) show that *economic complexity* is correlated with a country's current level of income and that deviations from this relationship predict future economic growth. As such, Figure 4.7 shows the relationship between *economic complexity* and GDP per capita across a sample of countries varying in terms of level of development and region. This indicates that the accumulation and mobilisation of productive capabilities is associated with higher levels of economic development.

For the purposes of this analysis, it is interesting to consider the positioning of sub-Saharan African countries (red triangle markers)

7 We generate measures of economic and product complexity using trade data from the BACI database, made available by CEPII, and the Stata programme – ecomplexity – developed by Sebastian Bustos and Muhammed Yildirim (Bustos & Yildirim 2016).

8 It is worth noting that a limitation of the complexity analytics described above is that the dataset only considers products and not services. This is concerning in the face of the rising share of services in international trade. The inclusion of services into the complexity analytics is constrained by the relative scarcity of services trade data.

9 This concept is best depicted in the product space analytics developed by (Hidalgo et al., 2007). Although, we do not use this analytic technique in this paper, we do apply it in a previous paper (Bhorat et al., 2016).

relative to developing East and South Asian countries (orange circle markers) and developed East Asian countries (round blue markers with labels).¹⁰ It is evident that sub-Saharan African countries are clustered in the south-west corner of the graph, and thus associated with lower levels of economic complexity and economic development. For the sample of sub-Saharan African countries, South Africa (see acronym ZAF in Figure 4.7) is an outlier with economic complexity level in line with other middle-income countries.

As with their levels of economic development, the economic complexity levels for the sample of Asian countries is spread across the distribution of countries. High-income Asian countries, such as Japan (JPN), South Korea (KOR), and Singapore (SGP), have high levels of productive capabilities. There are a number of Asian economies with low levels of economic complexity, similar or lower than the cluster of sub-Saharan African countries, but with higher levels of economic development (e.g. Sri Lanka (LKA); Papua New Guinea (PNG); Indonesia (IDN)). It may be that these Asian economies are better able to exploit their productive capabilities than their sub-

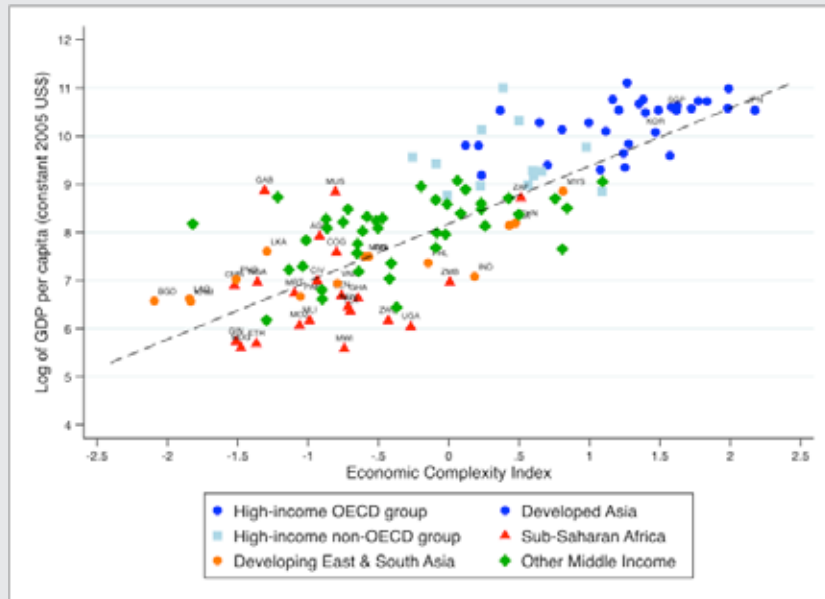
Saharan African peers. We also observe a number of middle income Asian economies, such as China (CHN), India (IND), Malaysia (MYS), Philippines (PHL) and Thailand (THA), with relatively high levels of economic complexity.

Therefore, it is evident that our sample of Asian economies, with some variation, tends to be characterized by higher levels of productive knowledge (or capabilities) than their sub-Saharan African counterparts. This may explain the relative differences in the manufacturing sectors across countries located within these two regions. Economic growth and development is about the accumulation of capabilities that allows firms within a country to produce increasingly complex products. These increasingly complex products are typically manufactured products. We take this further by considering the link between economic complexity and manufacturing.

Figure 4.8 shows the relationship between a country’s productive capabilities, measured as economic complexity, and the number of manufacturing products that it produces. Unsurprisingly, we first

10 For a summary of economic complexity levels across the sample of countries located within these two regions, see Appendix Table 5.

Figure 4.7: Economic Complexity (ECI) and the Log of GDP per capita by analytical group, 2013



Source: Own calculations using trade data from BACI data (HS 6-digit revision 1992) and GDP per capita data from the World Development Indicators.

Note: 1. The sample of countries is reduced to those for which we estimate complexity measures.

observe that countries with more productive capabilities produce a greater diversity of manufacturing products.¹¹ In addition, Figure 8 shows clearly that the sub-Saharan African countries (excluding South Africa) are clustered at low levels of economic complexity and produce a relatively low number of manufactured products.

Second, the sample of Asian economies is spread across levels of economic complexity with varying numbers of manufacturing products. For example, Lao (LAO) and Papua New Guinea (PNG) have low levels of economic complexity and produce relatively few manufactured products. Conversely, India (IND), Thailand (THA), China (CHN), Malaysia (MYS), South Korea (KOR) and Japan (JPN) are increasingly complex and produce a greater diversity of manufactured products. On average, developing countries in East and South Asia produce 2545 different manufactured products at a standard deviation of 1329 (at the HS6 level). In comparison, sub-Saharan Africa countries produce, on average, 1357 different

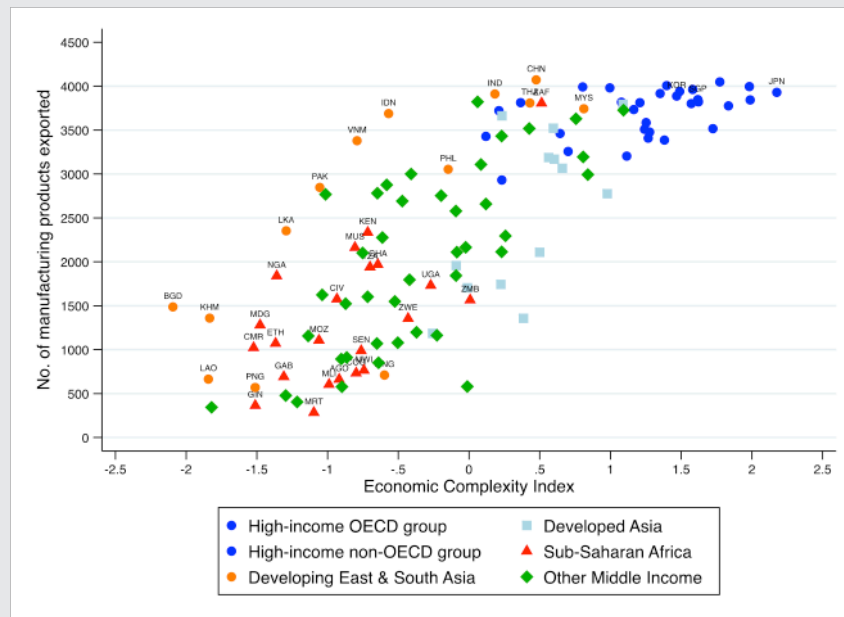
manufactured products at a standard deviation of 803 (at the HS6 level). Therefore, this is consistent with the Asian region, in comparison to sub-Saharan Africa, being comprised of countries with a greater range of complexity, translating then of course into a greater range of manufacturing products being produced. Therefore, the Asian region, relative to sub-Saharan Africa, is characterized by a greater heterogeneity in economic complexity, which corresponds with a greater cross-country range of manufacturing exports.

Third, we notice that in several instances, that for the same level of economic complexity, sub-Saharan African countries produce relatively less manufactured products than their Asian peers (for example, Sri Lanka (LKA) versus Nigeria (NGA) and Vietnam (VNM) versus Mauritius (MUS)).¹² This might be suggesting that, despite having similar levels of complexity, the capabilities embedded in the Asian economies, as revealed in their export baskets, are better

11 For a summary of economic complexity levels across the sample of countries located within these two regions, see Appendix Table 5.

12 The same pattern is evident when the sample of manufactured products is restricted to substantial exports in which a country's export of a product has a revealed comparative advantage.

Figure 4.8: Economic Complexity and Number of Manufactured Products Exported (HS6), 2013



Source: Authors' calculations using trade data from BACI data (HS 6-digit, revision 1992).

Notes: 1. The sample of countries is reduced to those for which we estimate complexity measures. 2. Determination of whether a manufactured product is exported by a country is not based on Revealed Comparative Advantage.

aligned to manufacturing than the capabilities embedded in the sub-Saharan African economies.¹³

A final point worth considering is the extent to which there are regional spillovers of productive capabilities, and hence the shifting of production of manufactured products across the region. For example, surely it is easier for a country to develop manufacturing capabilities (e.g. Vietnam) if its neighbour (e.g. China) already has these productive capabilities (for example, firms shifting production across the border to take advantage of lower input prices). Conversely, in sub-Saharan Africa, there are fewer economies clustered within a sub-region, possessing strong manufacturing capabilities, thus further constraining the potential to drive growth through regional spillovers.

Therefore, we observe that relative to their East and South Asian counterparts, sub-Saharan African countries are typically characterized by lower amounts of productive capabilities, and this is reflected in less diverse and developed manufacturing sectors.

3.3 Evolving Development Paths and Manufacturing

In the previous section, we advanced the notion that countries with higher levels of economic complexity, and hence more productive capabilities, produce a more diverse set of manufactured products. In this section, we provide a comparative product-level analysis of the evolution of export structures for two regions, sub-Saharan Africa and Eastern and Southern Asia, for the period 1995 to 2013.¹⁴ We provide a snapshot of these regions' respective development paths, with a specific focus on the transformation of their manufacturing sectors. We examine these evolving export structures along two product-level dimensions: the complexity of the product, and the capital-intensity associated with the production of the product. This allows us to (a) examine the notion that structural transformation is the process of shifting to increasingly complex products, and (b) consider the employment effects associated with such process (which we discuss in the next sub-section).

We start by examining the changing composition of exports across these two regions over the period 1995 to 2013, as depicted in Figure 4.18.¹⁵ Two key points emerge. First, the concentrated export structure centred on primary products for sub-Saharan African economies stands in contrast to the more diverse export structures of the East and South Asian economies. Primary products, which are characterized by low levels of complexity, constitute the bulk of the sub-Saharan African export basket (82.4 percent of total exports in 2013). In comparison, the export basket for developing East and South Asia is diversified across primary products (19 percent), resource-based manufactures (22.8 percent), low-tech manufactures (20 percent), medium-tech manufactures (17.6 percent) and high-tech manufactures (20.4 percent).

Second, while the sub-Saharan African export structure appears to have become increasingly concentrated in primary products, the export structures of the East and South Asian economies has shifted toward more technology-intensive manufactures. These technology-intensive manufactures are characterized by higher levels of complexity. The aggregate share of primary product exports in sub-Saharan Africa has thus increased by close to 10 percentage points, from 72.6 to 82.4 percent, over the period 1995 to 2013. The manufactured products exported by countries within this region are relatively low-complexity, resource-based manufactures, and this share has declined over the period. In the Asian case, the share of low-technology exports, although still significant, has dropped from 26.8 to 20 percent of total exports. However, in Asia there has been a shift toward more technology-intensive manufactures, with both high- and medium-technology manufactures experiencing increasing shares. In Asia then, there is a clear dominance of manufacturing products in the export basket, but more importantly, the composition of these manufactured exports is distinctly more diverse than that of sub-Saharan Africa.

Therefore, relating these regions' evolving export profile and structure to their economic growth performance over the period, the following is evident: First, the relatively high levels of economic growth in sub-Saharan Africa have been based disproportionately

13 The economic complexity index does not provide any information on the various types of capabilities present in an economy. Therefore, based on their export baskets, two countries may have similar levels of economic complexity but the underlying capabilities needed to produce and export the products comprising their export baskets may vary. The pattern observed in Figure 4.17 may be due to the capabilities present in Asian economies being better aligned to producing manufacturing products.

14 The proceeding analysis compares the evolving export structures of the Sub-Saharan African and Eastern and Southern Asian regions. For comparative purposes, export structures across countries within these regional groupings are aggregated into regional export structures. Sub-Saharan Africa comprises a sample of countries within the region, excluding South Africa, while the Asian regional aggregate comprises a sample of developing Eastern and Southern Asian countries, excluding China. The sample of countries across the regions is determined by which countries are included in the complexity analytics. For a list of countries included see Appendix Table 2.

15 Export shares are categorised according to the Lall (2000) technology classification. This classification groups products into five main categories: primary products, resource-based manufactures, low-technology manufactures, medium-technology manufactures, and high-technology manufactures. Resource-based manufactures and low-technology manufactures tend to be more unskilled-labour and labour-intensive. Skilled-labour requirements rises with technology intensity. See Appendix Table 4 for a description of the Lall categories.

on higher primary product export volumes and not growing complexity.¹⁶ Second, even when considering manufacturing in sub-Saharan Africa, the profile of products exported, are suggestive of a basket dominated by low-technology manufactures, manifest in lower levels of complexity. Third, Asian growth, by contrast, appears to be based on the development, of not only the development of a well-established manufacturing sector, but also of a sector that is shifting toward more technology-intensive manufactures, and hence more complex products. Therefore, whilst we reassert the view that Asian economic growth has been based on the growth and dominance in exported manufactured products, it is very clear with the evidence here, that this products basket is also based on an expanding share of more complex manufacturing exports.

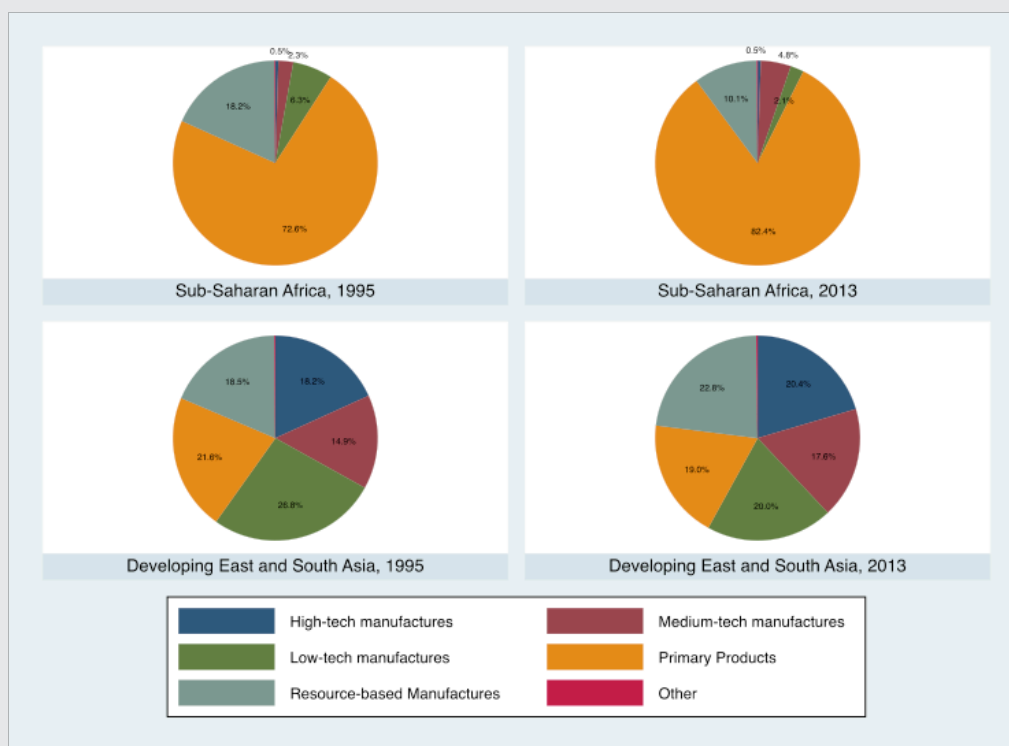
We now shift the analysis to the product-level to derive a more nuanced perspective on the evolving productive structures of economies within these two regional aggregates. With the use of scatter plots, we show the product-level evolution of the productive structures of these regional aggregates within the 'product complexity and revealed physical capital intensity' space. This space is defined by a horizontal axis showing the level of product complexity for each manufacturing product and a vertical axis showing the revealed physical capital intensity for each manufacturing product.¹⁷ Following Shirotori et al. (2010), the revealed physical capital intensity of product i is calculated as:

$$k_i = \sum_j \omega_i^j \frac{K^j}{L^j} \quad (7)$$

16 Presumably, the commodity price boom played a significant role in diverting resources toward natural resource extraction.

17 We use the 4-digit level of the Harmonised System (HS), which translates into approximately 994 manufacturing products.

Figure 4.9: Export Shares by Region and Lall Classification, 1995-2013



Source: Own calculations using trade data from BACI data (HS 6-digit, revision 1992).

Notes: 1. The sub-Saharan aggregate excludes South Africa, while the Developing East and South Asia aggregate excludes China.

where K^j is country j 's capital stock, L^j is its labour force, and ω_i^j is a weight given by

$$\omega_i^j = \frac{X_i^j / X^j}{\sum_i (X_i^j / X^j)} \tag{8}$$

where X_i^j is country j 's exports of product X^j , $\sum_i X_i^j$ is country j 's aggregate exports and $\sum_i (X_i^j / X^j)$ is the sum of product shares across countries. The weights, ω_i^j , are revealed comparative advantage (RCA) indices that sum to unity. The measure is the weighted average of the capital abundance of the countries exporting product i , and simply means that a product exported by a country that is richly endowed in physical capital is supposed to be capital-intensive.

Our approach here is the following: Manufacturing products are categorized according to whether they are 'entries' into the regional export portfolio (i.e. products not exported in 1995 but exported in 2013) or whether they are 'continuing' exports (i.e. products exported in both 1995 and 2013). The former provides insight into the type of manufacturing products that countries within the regions are diversifying into, while the latter provides insight into the products that comprise the existing manufacturing sector across countries within these regions. Separate graphs are provided for each product grouping in each regional grouping. The dashed horizontal and vertical lines in each scatter plot represent the mean revealed physical capital intensity and the mean product complexity for products classified as low-technology manufactures falling within the fashion cluster of the Lall (2000) classification. We can think of this reference point being represented by the cluster of products associated with the clothing and textiles industry. These lines provide a reference point for the capital intensity and product complexity associated with these labour-intensive products.

It is expected that an evolving export structure associated with both higher income levels and higher levels of employment would evolve and be depicted as such: First, one would observe a large and dominant distribution of products in the south-west corner, which are characterized by low complexity and high levels of labour intensity. Examples of clusters of products here would be clothing, textile, and processed foods. Second, over time one should observe a shift toward the north-east area of the diagram into more complex products—thereby generating an economic pathway to higher levels of income.

Such complex products would include, for example, electronics, machinery and chemicals. These graphics essentially then present the different stages of manufacturing export development over time, at the export product level in the complexity-capital intensity space.

Figure 4.10 presents the export structure pertaining to existing products, or products that are exported in 1995 and continue to be exported in 2013 from the sub-Saharan African region. Figure 4.11 depicts the export structure for the South and East Asian region.¹⁸

The clustering of bubbles to the south-west of Figure 4.10 suggests that exports from sub-Saharan African countries typically possess low levels of product complexity. The cluster of products to the left of the dashed vertical line have complexity levels below the average complexity for clothing and textile products, showing that a large share of SSA manufacturing exports are characterized by low levels of complexity (i.e. products below the horizontal line such as, raw sugar; manganese ore, aluminium ore, precious metal ore, knit sweaters, palm oil, and knit t-shirts).¹⁹ Existing manufacturing exports with complexity levels above the average for clothing and textiles (i.e. to the right of the dashed vertical line) are not job generators, and we see this most predominantly for the two products, refined petroleum and special purpose ships, depicted as the largest bubbles above the dashed horizontal line.

There are a number of existing exports clustered in the north-east of the graph that are associated with higher levels of product complexity and capital-intensity. However, the number of such products is limited and their share of trade is small. The graph points to a relatively underdeveloped manufacturing sector across the region.

Figure 4.12 provides insight into the path dependency of the SSA export basket. Hausmann et al. (2014) show that a country's existing export basket influences its subsequent diversification. Behind this is the notion that the more proximate the productive capabilities embodied in a country's existing export basket to the productive capabilities associated with products that it does not currently produce, the more easily it can shift to these products. Hausmann et al. (2014) also show that more complex products, typically manufacturing products, are more proximate (or connected) to other manufacturing products, and thus it is easier to shift to these other complex manufactured products if you already produce a

18 It is worth noting that we exclude South Africa and China from the sub-Saharan and East and South Asian aggregates, respectively. The graphics do not change substantially.

19 Products with the larger export shares (i.e. larger bubbles) are reported in brackets.

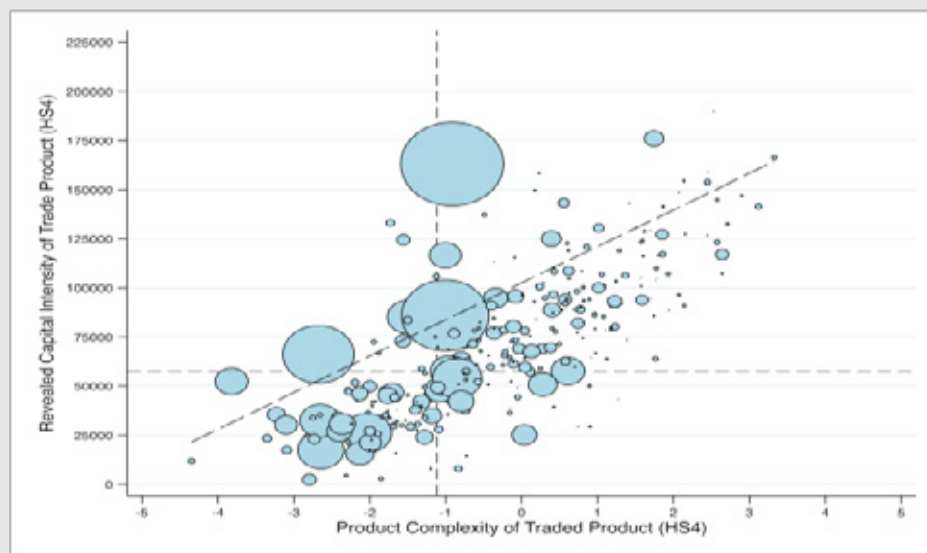
number of complex manufactured products. The implication of the SSA export basket being concentrated in products characterized by low levels of complexity and low levels of connectedness, is that it is harder for countries within the region to diversify into more complex manufacturing products.

In contrast, the East and South Asian export structure, observed in Figure 4.11, points to an established and integrated manufacturing sector. The region's export structure is spread relatively evenly across the 'product complexity-revealed capital intensity' space. The Asian export structure provides a number of insights. First, there seems to be an integrated chain of products in the product complexity-revealed capital intensity space, which is suggestive (much in the spirit of the product space approach) of Asian economies taking advantage of proximate products and building capabilities in them fairly efficiently. Second, this is clearly not the case in SSA, where the product complexity-revealed capital intensity space is far more 'lumpy' and disjointed.

Third, the thick cluster of low complexity and low capital intensity products in the south-west corner (typically textile and clothing

products such as, non-knit women's suits, non-knit men's suits, knit sweaters, leather footwear and knit t-shirts; non-retail pure cotton yarn), suggests consistent job creation in these established labour-intensive industries over time. This is in contrast with SSA where its cluster of products in the south-west corner is relatively small in comparison and concentrated in resource-based manufactures such as raw sugar, manganese ore, aluminium ore, and precious metal ore. Finally, the cluster of products in the north-east of the graph are relatively more complex and capital-intensive (for example, integrated circuits, computers, broadcasting equipment, telephones, office machine parts, semiconductor parts, rubber tires, video displays, air conditioners and cyclic hydrocarbons). The magnitude and diversity of these complex machinery, electronic and chemical products stands in contrast to the marginal nature of these types of complex products in the SSA export basket. This has implications on subsequent diversification, since complex products are associated with higher levels of connectedness. Thus by already producing these types of products, Asian countries are better placed to diversify into increasingly complex products (which we observe in Figure 4.13).

Figure 4.10: Evolution of Sub-Saharan Africa's Export Portfolio – Existing Products, 1995-2013



Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to manufacturing products.

Focus is now shifted to the way in which export structures within these regions have evolved. Figure 4.12 depicts the manufacturing products to which sub-Saharan African countries have shifted their focus. Correspondingly, Figure 4.13 depicts the way in which the East and South Asian export portfolio has evolved over the period 1995 to 2013.

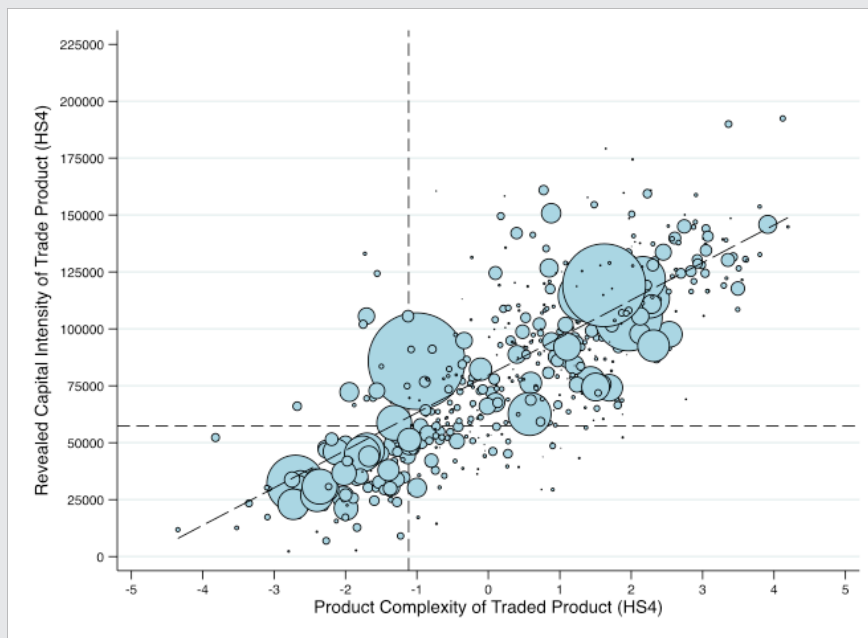
The pattern of entry into new manufacturing products in the sub-Saharan African region provides a number of insights. First, it seems that SSA is stuck in some sort of low complexity trap, associated with both low (copper ore, nickel mattes and titanium ore) and high (passenger and cargo ships) capital-intensive products.²⁰ Certainly, in terms of trade volumes, entry is concentrated in a handful of low complexity products. These entries to the south-west of the figure

are concentrated in resource-based activities, which is unlike the light manufacturing activities in clothing and textiles, which drove employment growth in Asia.

Second, although there is evidence of entry into relatively more complex manufactured products in the north-east corner of the graph (e.g. broadcasting equipment, saturated acyclic monocarboxylic acids, and construction vehicles), the share of exports accounted for by these products, and hence the scale, is relatively small. In particular, the scale of these entries is too small to become a platform for global expansion. The marginal nature of the entries into more complex products is in stark contrast to the East and South Asian experience (observed below) over the same period.

²⁰ It is important to note that we include resource-based manufacturing products and thus products such as copper ore and titanium ore appear in the sample of manufacturing products. We do provide the same scatter plots for the sample of manufacturing products being restricted to non-commodity based manufacturing products in Appendix Figures 2-5.

Figure 4.11: Evolution of East and South Asia’s Export Portfolio – Existing Products, 1995-2013



Source: Authors’ calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to manufacturing products.

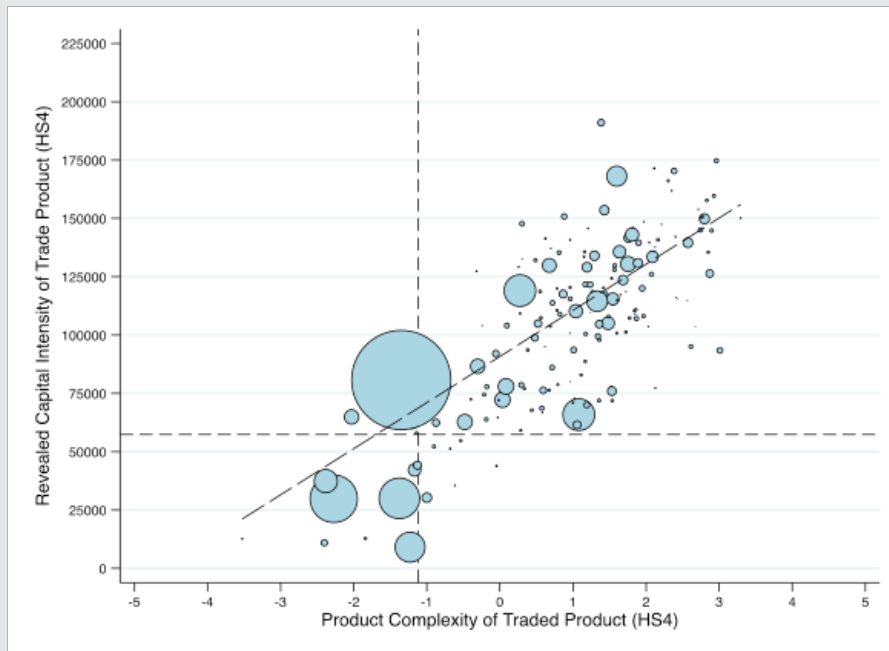
It is clear that SSAs existing export basket, as depicted in Figure 4.10, which is associated with low levels of complexity and connectedness has impacted on its subsequent pattern of diversification. The productive capabilities embodied in its existing export structure are distant from those needed in order to successfully shift into relatively more complex manufacturing products. As such, one can deduce from this that SSA countries have not accumulated the necessary capabilities needed for this shift, and hence the relative stagnation of its manufacturing sector.

The East and South Asian pattern of entry and hence diversification, depicted in Figure 4.13, stands in stark contrast to that evident in sub-Saharan Africa. This region's evolving export structure is biased toward increasingly complex and capital-intensive products (for example, packaged medicaments, delivery trucks, vehicle parts, ethylene polymers, and industrial printers). This is consistent with Figure 4.9, which shows rising export shares in medium- and high-

technology manufactured products that are typically more skill-, capital- and technology-intensive. Furthermore, the magnitude of these entries is relatively large, thus indicating that these manufacturing industries have experienced scale economies. Furthermore, it is evident that there is a growth-inducing path dependency associated with the pattern of development evident in the Asian picture, which we discuss in more detail below.

The extent to which Asian firms have been able to shift into increasingly complex manufactured products is summarized in Figure 4.14. In this graph, we show the distribution of product entries according to the level of complexity associated with the new product. It is evident than, on average, diversification in the Asian region is characterized by entries into more complex products relative to the African region. This is visible in the distribution of entries for Asia being to the right of the distribution of entries for SSA.

Figure 4.12: Evolution of Sub-Saharan Africa's Export Portfolio – Entry into New Products in 2013



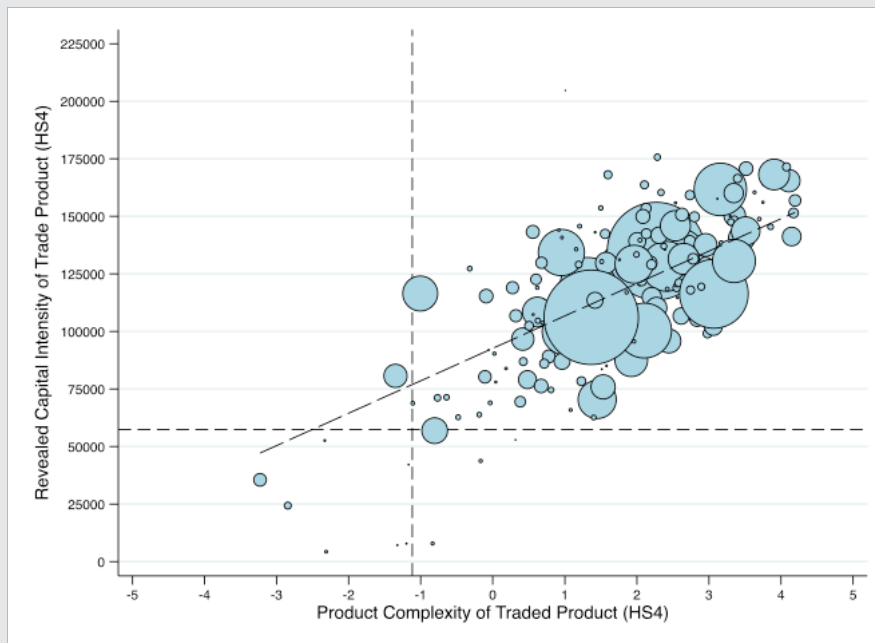
Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to manufacturing products.

A question worth considering is why Asian firms have been able to shift more easily into these increasingly complex manufactured products? Complexity analytics offers an explanation for this varying pattern of diversification across the two regions. In a recent working paper, Borat et al. (2016) use complexity analytics to explain manufacturing performance in Africa. Informed by Hidalgo et al. (2007), they argue that the process of structural transformation is a path dependent process, whereby countries accumulate productive capabilities and thereby shift production toward increasingly complex and proximate manufacturing products, based on the existing levels of capabilities. They find that the extent to which a country can diversify its export structure toward an increasing number of proximate manufactured products is dependent upon the connectedness of its initial productive structure. If the capability set exists, these products can be expanded into. The dynamic process of growing a new productive structure and hence export basket, revolves around upgrading a country's capability set over time.

This provides insight into what we observe in the scatter plots above. Asian economies are better able to enter new manufacturing product markets because the required capabilities are similar or close to those it currently possesses. For instance, if a firm in a country is able to assemble motor vehicles for the international market, a lot of the inputs needed to enter the international car parts market are already in place, such as logistics networks, supply networks, port infrastructure, and the like. Hence, the shift into new complex product markets in the north-east corner of Figure 4.13. Conversely, sub-Saharan Africa's productive structure is concentrated in less complex resource-based products where the embedded capabilities are relatively distant from those needed to produce complex manufactured products. Hence, the sub-Saharan export structure remaining stagnant in the south-west corner of Figure 4.10 and Figure 4.12.

Figure 4.13: Evolution of East and South Asia's Export Portfolio – Entry into New Products in 2013



Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to manufacturing products.

Therefore, the preceding analysis provides the following key points: First, the East and South Asian export structure and profile are more diverse and, consequently, more complex than its sub-Saharan African counterpart. In the Asian case, we observe a greater number of existing products and new products associated with higher levels of economic complexity in the north-east quadrant. In addition, the sheer scale of exports in these relatively complex products suggests established and integrated manufacturing sectors in Asia. In the SSA case, existing products as well as new products are typically located in the low complexity south-west quadrant. In addition, the share of exports is concentrated in a few of these products, this suggesting a less diverse export basket. Second, and importantly, not only have East and South Asian firms found it easier to shift into increasingly complex manufactured products than their sub-Saharan African counterparts, but the magnitude of this diversification has been substantial. It is clear that the integrated structure of the Asian export basket points to the productive capabilities embedded in its existing export basket being relatively proximate to those needed in order to shift into more complex manufactured products. As such, we observed a substantial shift into complex manufacturing products over the period. The relatively disconnected and patchy export

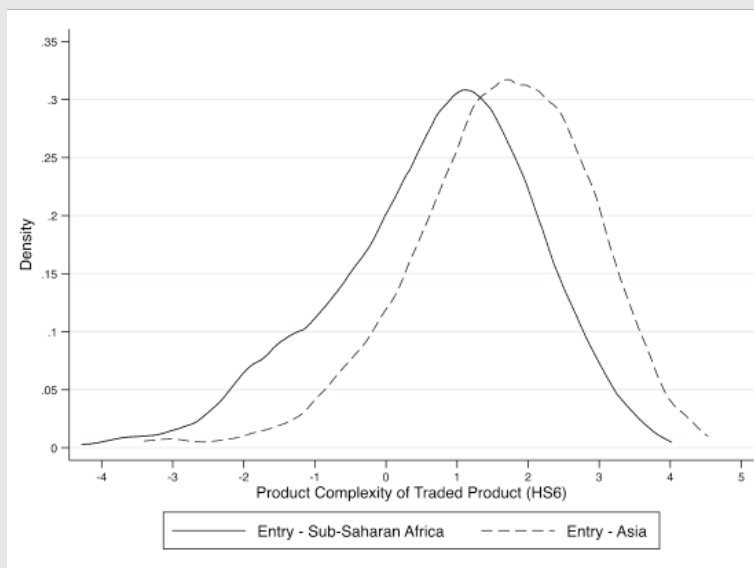
basket for SSA, pointed to the productive capabilities embedded in its existing export basket being distant from those needed to successfully shift into more complex manufacturing products.

3.4 Employment and Manufacturing

In light of the above discussion on the development trajectories pertaining to each of these regions, we now provide a discussion on how these evolving productive structures relate to employment. The manufacturing sector in the Asian region, particularly the East Asian region, has been a major source of employment for the countries that comprise this region. It is hoped that sub-Saharan African countries undergo similar manufacturing-led economic growth and are thus able to employ a young and growing labour force.

Implicitly, we have argued that growing a manufacturing sector, and hence generating manufacturing jobs, is about shifting toward a greater multitude of complex manufacturing activities and thereby building complexity within an economy. Therefore, to conclude, we consider the link between economic complexity and employment across the two regions over time. Table 4.3 shows the aggregate levels of employment in manufacturing, as well as the mean

Figure 4.14: Distribution of Entries by Region



Source: Authors' calculations using trade data from BACI data (HS 6-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 2. Trade flows restricted to manufacturing products.

economic complexity score for the two regions in 1995 and 2010. This allows one to observe trends in manufacturing employment growth in relation to economic complexity growth. A simple elasticity measure is included, where the percentage change in manufacturing employment in response to a percentage change in economic complexity is shown.

The employment data evident in Table 4.3 in conjunction with the export data analysis above, indicates the sheer scale of the manufacturing sector in the East and South Asian regions and hence it being a major source of employment. The manufacturing sector provided 61 million jobs in 1995 and this grew by 17 million to 78 million jobs in 2010. In comparison, the manufacturing sector in SSA is substantially smaller, providing 4 million jobs in 1995, but notably more than doubling to 9 million in 2010. Simply put, our data illustrates that the manufacturing sector in Asia is larger and more diverse than its sub-Saharan African counterpart, and is thus able to employ more workers. The Asian manufacturing sector is spread more evenly across products varying in complexity and capital-intensity, and hence offers more employment opportunities for a greater range of workers across the manufacturing spectrum. The African manufacturing sector, in contrast, is relatively small and concentrated and thus offers substantially fewer employment opportunities to a smaller range of workers.

We also observed in the analysis in the previous section, that Asian economies have been better able to shift production into increasingly complex manufactured products, relative to their SSA counterparts. Furthermore, the sheer scale of entry into these new product markets is again substantially greater than that achieved by their SSA counterparts. This is reflected in a bigger increase in the Asian region's economic complexity score (0.34) relative to that experienced in SSA (0.13). Part of the explanation for the

Asian regions ability to shift easily into relatively more complex manufactured products relates to the complexity of its existing export basket and the associated connectedness of this relatively more complex export basket. This is reflected in the economic complexity levels for the region, which have shifted from -0.06 to 0.28. Conversely, although shifting upward, the economic complexity levels in SSA are substantially lower (-1.05 to -0.92). The lower levels of connectedness associated with less complex export baskets provides insight into the regions inability to grow its productive capabilities and shift to more complex manufacturing products.

Finally, we observe that the elasticity of manufacturing employment in relation to a percentage change in economic complexity is substantially higher for SSA (10.42) than Asia (0.05). This is perhaps unsurprising since employment growth in manufacturing in SSA is occurring off a relatively low base. This may suggest that there is potential for more rapid manufacturing-led employment growth within the SSA region, which offers hope to countries within the region that are faced, as noted in detail above, with young and growing labour forces.

4 CONCLUSION

The major challenge facing the countries that comprise sub-Saharan Africa is a young and growing labour force. This challenge can be viewed as an opportunity since an expanded labour force, if employed, can increase output and thereby generate economic growth. However, the question of key importance concerns where these jobs are going to emerge from. The Asian story is one where industrialisation and the growth of manufacturing activities acted as a source of growth and employment. As such, the question arises whether countries within sub-Saharan Africa can experience a similar manufacturing-led growth path.

Table 4.2: Economic Complexity and Employment

Region	Total Employment in Manufacturing (Thousands)			Working Age Population (Billion)			Elasticity
	1995	2010	Δ	1995	2010	Δ	
South-East Asia	61 059	78 291	17 232	-0.06	0.28	0.34	0.05
Sub-Saharan Africa	4 023	9 221	5 198	-1.05	-0.92	0.13	10.42

Source: Authors' calculations using Groningen Growth and Development Centre 10-sector database (see Timmer et al., 2014) and BACI data (HS 6-digit, revision 1992) to create economic complexity measure.

Notes: 1. South-East Asian countries include: India, Indonesia, Malaysia, Philippines and Thailand.

Sub-Saharan African countries include: Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, Tanzania and Zambia. 2. Elasticity is measured as follows: $\frac{\% \Delta \text{ Manufacturing Jobs}}{\% \Delta \text{ ECI Score}}$

The analysis above shows a sub-Saharan African productive structure that is disconnected and characterized by products with low levels of economic complexity. Inherent in a productive structure characterized by lower levels of economic complexity is the notion of limited productive capabilities. Furthermore, as revealed in a previous study, these productive capabilities are distant from those needed in order to produce increasingly complex manufacture products (Bhorat et al., 2016). This stands in contrast to an East and South Asian productive structure that is connected and complex. East Asian economies are able to shift into increasingly complex manufactured products because the productive capabilities imbedded in their existing productive structure are similar to those required in order to shift into these products.

This has implications for the extent to which the manufacturing sector can generate employment. The sheer scale and diversity of the manufacturing sector in Asia allows for the generation of a large number and diversity of employment opportunities. Conversely, the marginal nature of the African manufacturing sector points to limited employment opportunities. However, the relatively high employment to economic complexity elasticity for Africa offers hope. By growing complexity, countries within the region may initially be able to undergo relatively rapid employment growth if they grow their manufacturing sectors. Nevertheless, if Africa is to generate jobs through manufacturing led industrialisation it needs to accumulate the productive capabilities that will allow it to do so.



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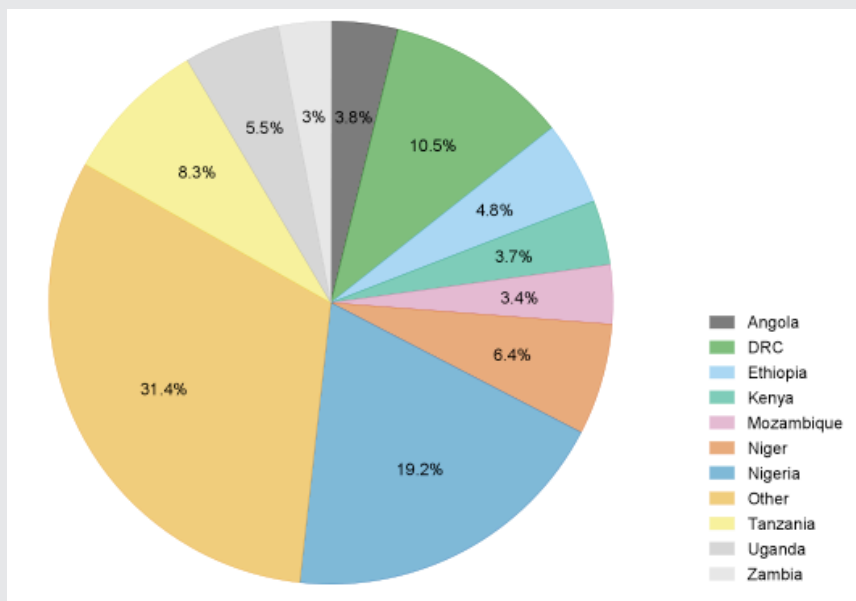
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Appendix Figure 1: Share of Sub-Saharan African Population Growth by Country, 2015-2100



Source: Authors' calculations using the UN World Population database.

Appendix Table 1: Share of Employment by Sector for Asian and SSA Aggregates, 1975-2010

Sector	Africa			Asia		
	1975	2010	Change	1975	2010	Change
Agriculture	67.8	58.9	-8.9	68.4	40.1	-28.3
Mining	1.1	0.7	-0.4	0.9	0.9	0.0
Manufacturing	6.2	6.6	0.4	11.0	15.8	4.8
Services	22.7	30.9	8.2	17.2	35.5	18.3
Other	2.2	2.9	0.7	2.5	7.7	5.2

Source: Authors' calculations using Groningen Growth and Development Centre 10-sector database (see Timmer et al., 2014).

Appendix Table 2: List of Countries Included in Complexity Estimations

ISO	Country	ISO	Country	ISO	Country
AGO	Angola	GTM	Guatemala	OMN	Oman
ALB	Albania	HND	Honduras	PAK	Pakistan
ARE	United Arab Emirates	HRV	Croatia	PAN	Panama
ARG	Argentina	HUN	Hungary	PER	Peru
AUS	Australia	IDN	Indonesia	PHL	Philippines
AUT	Austria	IND	India	PNG	Papua New Guinea
AZE	Azerbaijan	IRL	Ireland	POL	Poland
BEL	Belgium-Luxembourg	IRN	Iran	PRT	Portugal
BGD	Bangladesh	ISR	Israel	PRY	Paraguay
BGR	Bulgaria	ITA	Italy	QAT	Qatar
BIH	Bosnia Herzegovina	JAM	Jamaica	ROM	Romania
BLR	Belarus	JOR	Jordan	RUS	Russian Federation
BOL	Bolivia	JPN	Japan	SAU	Saudi Arabia
BRA	Brazil	KAZ	Kazakhstan	SEN	Senegal
CAN	Canada	KEN	Kenya	SER	Serbia
CHE	Switzerland	KGZ	Kyrgyzstan	SER	Serbia
CHL	Chile	KHM	Cambodia	SGP	Singapore
CHN	China	KOR	Rep. of Korea	SLV	El Salvador
CIV	Côte d'Ivoire	KWT	Kuwait	SUD	Sudan
CMR	Cameroon	LAO	Lao	SUD	Sudan
COG	Congo	LBN	Lebanon	SVK	Slovakia
COL	Colombia	LBY	Libya	SVN	Slovenia
CRI	Costa Rica	LKA	Sri Lanka	SWE	Sweden
CUB	Cuba	LTU	Lithuania	SYR	Syria
CZE	Czech Rep.	LVA	Latvia	THA	Thailand
DEU	Germany	MAR	Morocco	TJK	Tajikistan
DNK	Denmark	MDA	Moldova	TKM	Turkmenistan
DOM	Dominican Rep.	MDG	Madagascar	TTO	Trinidad and Tobago
DZA	Algeria	MEX	Mexico	TUN	Tunisia
ECU	Ecuador	MKD	Macedonia	TUR	Turkey
EGY	Egypt	MLI	Mali	TZA	Tanzania
ESP	Spain	MNG	Mongolia	UGA	Uganda
EST	Estonia	MOZ	Mozambique	UKR	Ukraine
ETH	Ethiopia	MRT	Mauritania	URY	Uruguay
FIN	Finland	MUS	Mauritius	USA	USA

ISO	Country	ISO	Country	ISO	Country
FRA	France	MWI	Malawi	UZB	Uzbekistan
GAB	Gabon	MYS	Malaysia	VEN	Venezuela
GBR	United Kingdom	NGA	Nigeria	VNM	Viet Nam
GEO	Georgia	NIC	Nicaragua	YEM	Yemen
GHA	Ghana	NLD	Netherlands	ZAF	South Africa
GIN	Guinea	NOR	Norway	ZMB	Zambia
GRC	Greece	NZL	New Zealand	ZWE	Zimbabwe

Notes: We follow the same procedure for choice of country as applied in the Atlas of Economic Complexity (Hausmann et al., 2014). The following criteria apply: First, countries must have GDP and export information. Second, countries must have a population in excess of 1.2 million and trade value in excess of \$1 billion. Finally, countries must have reliable data.

Appendix Table 3: Share of Exports by Region and Lall Classification, 1995-2013

Lall Classification	Eastern & Southern Africa			West Africa			East Asia & Pacific			South Asia		
	1995	2013	Δ	1995	2013	Δ	1995	2013	Δ	1995	2013	Δ
High-tech Manufactures	0.8	0.9	0.1	0.4	0.3	-0.1	21.8	25.0	3.2	2.8	8.3	5.5
Medium-tech Manufactures	4.1	4.1	-0.01	1.4	5.2	3.8	15.6	18.2	2.6	11.7	15.9	4.2
Low-tech Manufactures	14.0	3.7	-10.3	2.2	1.0	-1.1	20.0	15.2	-4.7	56.0	32.6	-23.4
Primary Products	67.8	80.8	13.0	75.2	83.6	8.4	22.4	20.3	-2.1	18.0	15.5	-2.5
Resource-based Manufactures	13.1	10.4	-2.7	20.9	9.8	-11.1	20.1	21.0	0.9	11.4	27.6	16.2
Total	100	100		100	100		100	100		100	100	

Source: Authors' calculations using trade data from BACI data (HS 6-digit, revision 1992).

Notes: 1. The sample of countries is reduced to those for which we estimate complexity measures.

Appendix Table 4: Lall (2000) Technology Classification

LALL TECHNOLOGY CLASSIFICATION	EXAMPLES
PRIMARY PRODUCTS (PP)	Fresh fruit, meat, rice, cocoa, tea, coffee, wood, coal, crude petroleum, gas
MANUFACTURED PRODUCTS	
<u>Resource based manufactures</u>	
RB1: Agro/forest based products	Prepared meats/fruits, beverages, wood products, vegetable oils
RB2: Other resource based products	Ore concentrates, petroleum/rubber products, cement, cut gems, glass
<u>Low technology manufactures</u>	
LT1: 'Fashion cluster'	Textile fabrics, clothing, headgear, footwear, leather manufactures, travel goods
LT2: Other low technology	Pottery, simple metal parts/structures, furniture, jewellery, toys, plastic products
<u>Medium technology manufactures</u>	
MT1: Automotive products	Passenger vehicles and parts, commercial vehicles, motorcycles and parts
MT2: Process industries	Synthetic fibres, chemicals and paints, fertilisers, plastics, iron, pipes/tubes
MT3: Engineering industries	Engines, motors, industrial machinery, pumps, switchgear, ships, watches
<u>High technology manufactures</u>	
HT1: Electronics and electrical products	Office/data processing/telecommunications equip, TVs, transistors, turbines, power generating equipment
HT2: Other high technology	Pharmaceuticals, aerospace, optical/measuring instruments, cameras
OTHER TRANSACTIONS	
other	Electricity, cinema film, printed matter, 'special' transactions, gold, art, coins, pets

Source: (Lall, 2000)

Appendix Table 5: ECI and Change in ECI for sub-Saharan African and East and South Asian Countries, 1995-2013

Country	WB Income Group	Region	1995	2013	Change
Japan	High income: OECD	East Asia	2.43	2.18	-0.25
Singapore	High income: nonOECD	East Asia	0.73	1.62	0.89
Rep. of Korea	High income: OECD	East Asia	0.62	1.47	0.85
Malaysia	Upper middle income	East Asia	-0.03	0.81	0.85
South Africa	Upper middle income	Sub-Saharan Africa	0.63	0.51	-0.12
China	Upper middle income	East Asia	-0.02	0.47	0.49
Thailand	Upper middle income	East Asia	-0.33	0.43	0.76
India	Lower middle income	South Asia	0.04	0.18	0.14
Zambia	Lower middle income	Sub-Saharan Africa	-0.27	0.01	0.28
Philippines	Lower middle income	East Asia	-0.85	-0.15	0.70
Uganda	Low income	Sub-Saharan Africa	-0.52	-0.27	0.25
Zimbabwe	Low income	Sub-Saharan Africa	-0.01	-0.43	-0.42
Indonesia	Lower middle income	East Asia	-0.71	-0.57	0.14
Mongolia	Upper middle income	East Asia	-0.80	-0.60	0.20
Ghana	Lower middle income	Sub-Saharan Africa	-1.40	-0.64	0.76
Tanzania	Low income	Sub-Saharan Africa	-1.00	-0.70	0.30
Kenya	Lower middle income	Sub-Saharan Africa	-0.23	-0.72	-0.48
Malawi	Low income	Sub-Saharan Africa	-0.96	-0.74	0.22
Senegal	Lower middle income	Sub-Saharan Africa	-0.87	-0.76	0.11
Viet Nam	Lower middle income	East Asia	-1.49	-0.79	0.70
Congo	Lower middle income	Sub-Saharan Africa	-0.56	-0.80	-0.24
Mauritius	Upper middle income	Sub-Saharan Africa	-1.03	-0.81	0.22
Angola	Upper middle income	Sub-Saharan Africa	-1.72	-0.92	0.80
Côte d'Ivoire	Lower middle income	Sub-Saharan Africa	-0.85	-0.93	-0.09
Mali	Low income	Sub-Saharan Africa	-0.85	-0.99	-0.14
Pakistan	Lower middle income	South Asia	-1.00	-1.05	-0.06
Mozambique	Low income	Sub-Saharan Africa	-0.89	-1.06	-0.17
Mauritania	Lower middle income	Sub-Saharan Africa	-1.06	-1.10	-0.04
Sri Lanka	Lower middle income	South Asia	-1.28	-1.29	-0.01
Gabon	Upper middle income	Sub-Saharan Africa	-1.20	-1.31	-0.11
Nigeria	Lower middle income	Sub-Saharan Africa	-1.98	-1.36	0.62
Ethiopia	Low income	Sub-Saharan Africa	-1.05	-1.37	-0.32
Madagascar	Low income	Sub-Saharan Africa	-1.46	-1.48	-0.01
Guinea	Low income	Sub-Saharan Africa	-0.99	-1.51	-0.53
Papua New Guinea	Lower middle income	East Asia	-2.40	-1.51	0.89

Country	WB Income Group	Region	1995	2013	Change
Cameroon	Lower middle income	Sub-Saharan Africa	-1.02	-1.52	-0.51
Cambodia	Low income	East Asia	-1.81	-1.83	-0.03
Lao	Lower middle income	East Asia	-1.72	-1.84	-0.12
Bangladesh	Lower middle income	South Asia	-1.64	-2.09	-0.46

Source: Authors' calculations using trade data from BACI data (HS 6-digit, revision 1992).

Notes: 1. The sample of countries is reduced to those for which we estimate complexity measures.

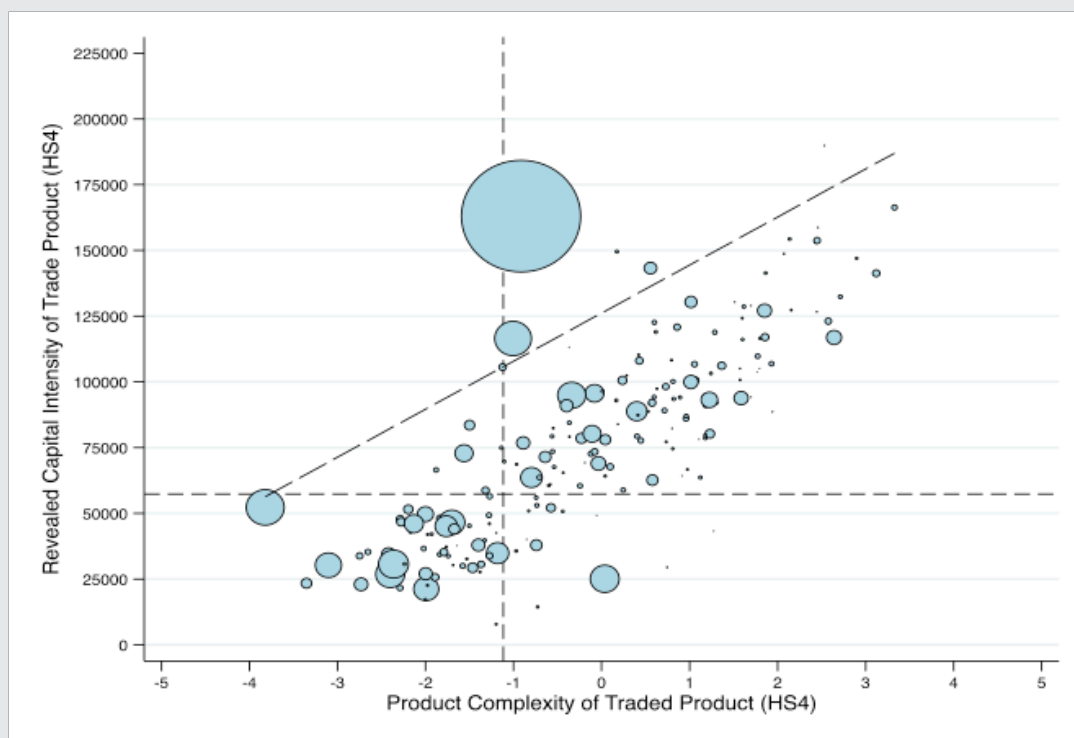
Appendix Table 6: Export Dynamics by Region and Lall Classification, 1995-2013

Lall Classification	Sub-Saharan Africa		Developing East and South Asia	
	Continue	Entry	Continue	Entry
A. Aggregate by Region				
High-tech Manufactures	34	71	143	137
Medium-tech Manufactures	176	245	415	413
Low-tech Manufactures	496	234	975	200
Primary Products	342	96	359	117
Resource-based Manufactures	291	191	502	280
Other	11	7	12	6
B. Country average within Region				
High-tech Manufactures	1	18	12	39
Medium-tech Manufactures	6	46	41	91
Low-tech Manufactures	25	92	165	160
Primary Products	32	57	49	69
Resource-based Manufactures	19	79	54	110
Other	1	1	1	2

Source: Authors' calculations using trade data from BACI data (HS 6-digit, revision 1992).

Notes: 1. The sample of countries is reduced to those for which we estimate complexity measures.

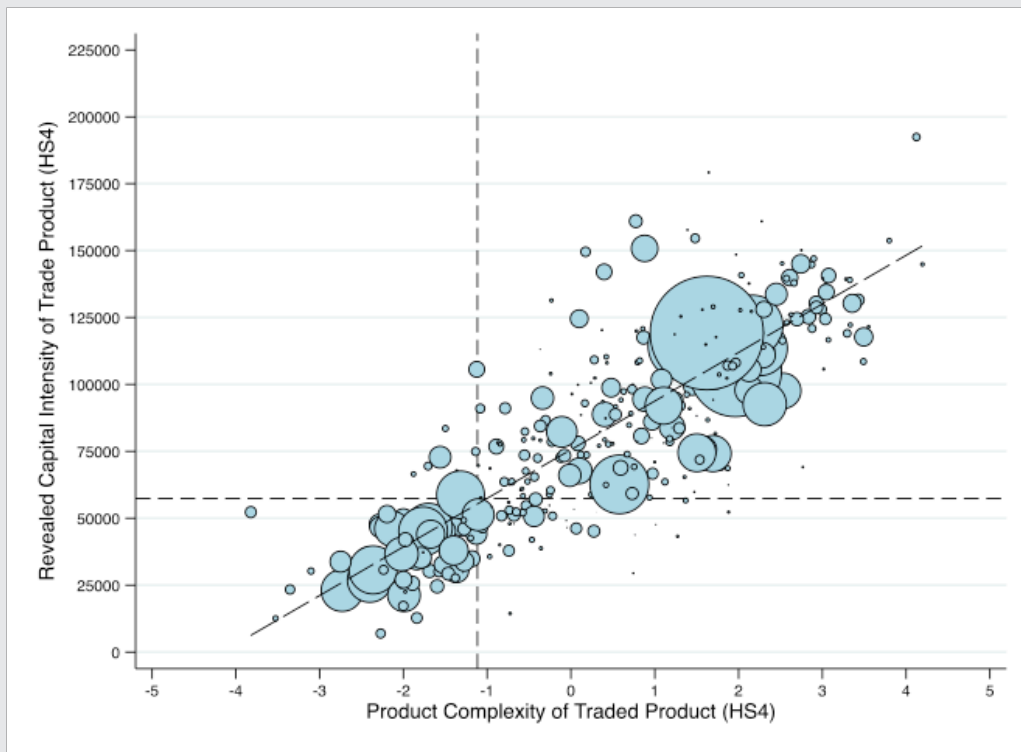
Appendix Figure 2: Evolution of Sub-Saharan Africa's Export Portfolio for Non-Commodity-based Manufactures – Existing Products, 1995-2013



Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to non-commodity-based manufacturing products.

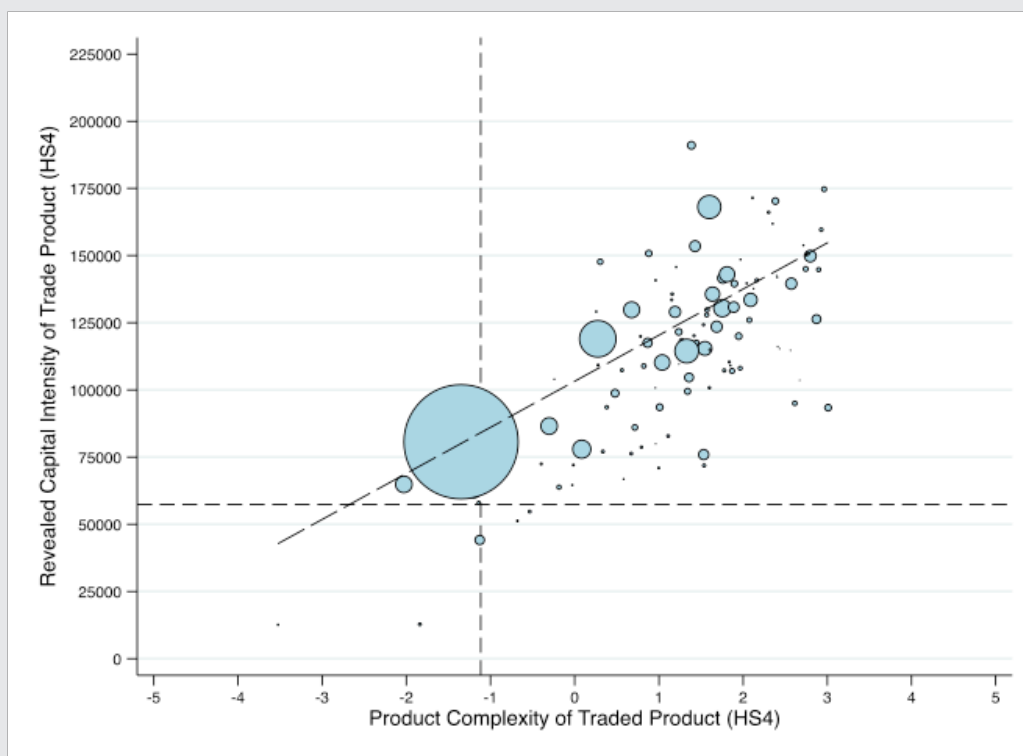
Appendix Figure 3: Evolution of East and South Asia's Export Portfolio for Non-Commodity-based Manufactures – Existing Products, 1995-2013



Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

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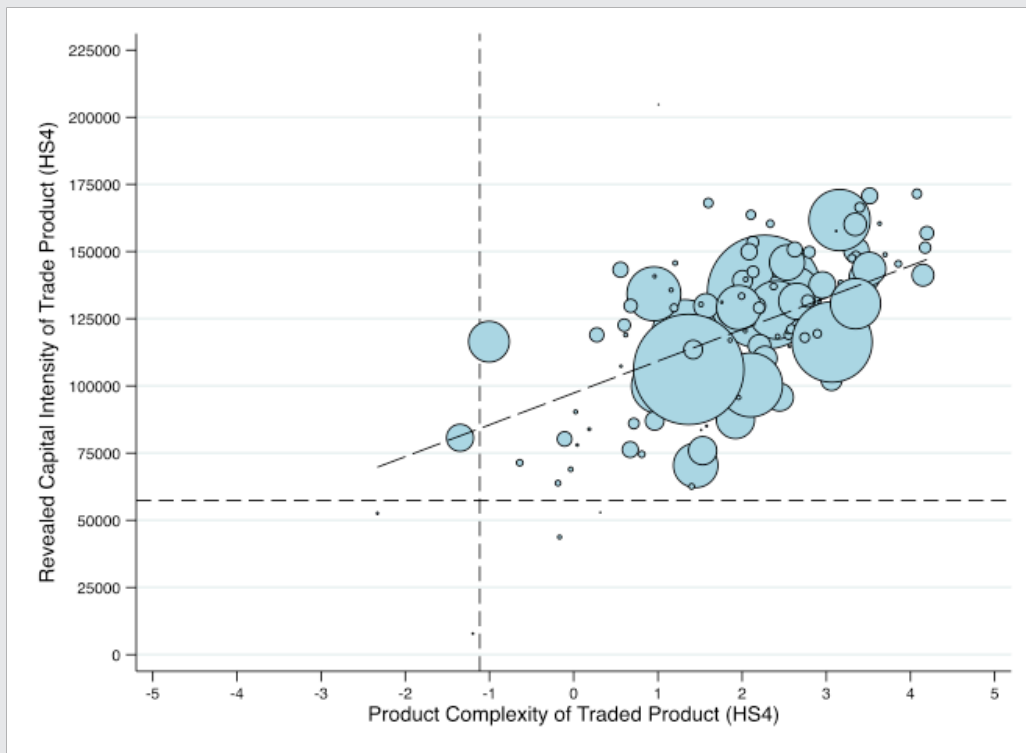
Appendix Figure 4: Evolution of Sub-Saharan Africa's Export Portfolio for Non-Commodity-based Manufactures – Entry into New Products in 2013



Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to non-commodity-based manufacturing products.

Appendix Figure 5: Evolution of East and South Asia's Export Portfolio for Non-Commodity-based Manufactures – Entry into New Products in 2013



Source: Authors' calculations using trade data from BACI data (HS 4-digit, revision 1992) to create product complexity measure, and revealed factor intensity data developed by Shirotori et al. (2010).

Notes: 1. Traded products are classified at the 4-digit level of the Harmonised System (HS), with each bubble representing a 4-digit product line. 2. The size of each bubble represents the share of that product in total exports in the final period, 2013. 3. The horizontal and vertical lines in each scatter plot represent the average revealed capital intensity and the average product complexity for low-technology manufactures falling within the fashion cluster of the Lall (2000) classification (i.e. clothing and textiles). 4. Trade flows are restricted to products in which at least one country within a region has a revealed comparative advantage. 5. Trade flows restricted to non-commodity-based manufacturing products.



Cup of coffee and spilled grain. © 2017. Shutterstock images



CHAPTER 5

ETHIOPIA: LESSONS FROM AN EXPERIMENT

Arkebe Ogubay



Arkebe Ogubay

Minister and Special Advisor to the Prime Minister of Ethiopia

1. BEYOND BOOM AND BUST IN AFRICA

The “African Rising” or “African lions on the move” narrative that has gained currency in recent years emphasizes the growth on the continent in the early part of the new millennium. External factors, especially prices and growing demand for primary commodities, have been favorable.¹ While such growth in Africa has been celebrated, however, efforts to understand the structural drivers of longer-term economic development in African countries have been inadequate. The swing between the tragedy of “Afro-pessimism” and the hyperbole of “Afro-euphoria” has been coupled with an erroneous “African dummy” analytical approach that overlooks the continent’s diversities (Cramer and Chang 2015). These tropes are not only remote from reality, but they also lack the perspective that growth should be underpinned by structural change.

As global demand for commodities dropped after 2014, along with prices, various concerns were raised, and observers, scholars, and policymakers offered valid insights. For instance, an article entitled “Africa’s Boom Is Over” boldly proclaimed, “Africa was never going to get far without manufacturing” (Rowden 2015).² Africa obviously performed better in the early 2000s, but views have diverged on the drivers of this growth and on its sustainability, and on whether this growth will translate into structural change. The “Afro-euphoria” of recent years was just as removed from reality as its predecessor, the dismissive “Afro-pessimism.”

From a long-term perspective, a promising approach to understanding these dynamics is a *structural transformation* perspective, based on the view that the essence of economic development is economic transformation and structural change embedded in sectoral shifts, sustained productivity rises, and constant technological advances, which are achieved through effective industrial policies and state activism (Johnson 1982; UNCTAD and UNIDO 2011; Mazzucato 2013; UNCTAD 2016).³ Although many skeptics have argued that industrial policies cannot work in Africa, it has become more fashionable to talk about such policy in recent years. Nevertheless, it is unclear what industrial policies entail in practical terms. Perhaps, it is time to examine and learn from the practice of industrial policies in African countries. Ethiopia is an ideal case study, since the country has achieved rapid economic growth over the past two decades, despite being located in a complex and challenging geopolitical region. This growth has not been fuelled by mineral exports, and while manufacturing remains small, Ethiopia has been engaged in industrial policies in key priority areas.⁴

2. INDUSTRIAL POLICY AND STRUCTURAL TRANSFORMATION IN ETHIOPIA

2.1. Perspectives on policy and transformation

Structural transformation is the prime driver of economic and social development. It involves the movement of people and outputs across sectors and within specific industries, and a shift from lower to higher productivity economic activities. It is argued that growth

1 For instance, see the recent McKinsey Global Institute report. (Bughin et al. 2016).

2 See, also, “Africa’s Boom,” African Business IC Publication, No 428, March 2016 (Thomas 2016).

3 For an in-depth understanding of structural transformation, see Kaldor (1967); Ocampo, Rada, and Taylor (2009); and Thirlwall (2013).

4 The Ethiopian economy grew annually by 10.8 percent between 2003–04 and 2014–15, driven by productive sectors and without any resource boom (MOFED 2010; NPC 2016). This annual growth rate is twice the average for sub-Saharan Africa. Average life expectancy increased by 19 years, from 45 to 64 years, between 1991 and 2014. The number of people living under the poverty line was halved from 50 to 25 percent in the same period. The government has focused on long-term investment programs, with a special focus on infrastructure development (especially in energy and modern transport), and university and technical schools. Despite rapid economic growth, the expansion of exports and manufacturing—and changes in their composition—has been inadequate

and structural changes can be sustained when driven by manufacturing. Manufacturing is an engine of growth, because it is positively *causally* related to the growth of GDP and rises in productivity in the whole economy (Kaldor 1967; Thirlwall 2013).⁵ Sectoral shifts occur through diversification into new activities, and development of domestic linkages and technological capabilities.⁶ This is because of increasing returns to scale, learning-by-doing, linkages (including intersectoral), innovation, and technological advancement. Historical experience suggests, further, that manufactured exports are particularly important, given the constraint of balance of payments on growth. Nonetheless, structural transformation and catch-up is uneven, unpredictable, and compounded by political tensions (Cramer and Chang 2015; Whitfield et al. 2015).

Growth cannot be sustained without rapid expansion of exports and fundamental changes in the composition of those exports. Exports play a strategic role in structural transformation by expanding the limits on market demand, enabling productivity spillover, driving technological advancement, loosening the constraint of balance of payments, allowing the full utilization of domestic resources, and nurturing import–substitution industrialization (ISI) (Ocampo, Rada, and Taylor 2009; Thirlwall 2013). Ocampo, Rada, and Taylor (2009, 152) highlighted the “major task of structural transformation policies is to facilitate a dynamic restructuring of production and trade toward activities with higher technological content.” Industrial policies have been used by forerunners and latecomers in the 19th and 20th centuries for catching up and economic transformation (List 1856; Hamilton 1934; Chang 2003; Nayyar 2013).⁷ Such policies are “a strategy that involves a range of implicit or explicit policy instruments selectively focused on specific industrial sectors for shaping structural change in line with a broader national vision and strategy” (Oqubay 2015, 18). Hence, industrial policies should serve as vehicles for structural transformation and catch-up.

In this chapter, we will review industrial policy in Ethiopia with the aim of extracting lessons from the comparative review of labour-intensive export-oriented sectors, such as leather and leather products; capital-intensive, import–substitution industries, such as the cement industry; and high productivity modern agriculture, such as floriculture.⁸ These three sectors have different industrial structures and can collectively illustrate the practice of industrial policy and uneven outcomes in Ethiopia.⁹

2.2 A strategic import–substitution industry

The industry's context

Cement manufacture is considered a basic industry that plays a strategic role in late industrialization, and is characterized by high capital intensity and process production. The global cement industry has been dominated lately by Chinese consumption, supply, and equipment provision.¹⁰ It has strong linkages with the construction industry and transport sector. The industry features significant economies of scale and is dominated by large firms, and its expansion is driven by capital deepening rather than capital widening.¹¹ The African cement industry is highly fragmented, with underdeveloped economies of scale and technology.

In Ethiopia, the cement industry emerged in the mid-1960s, and until 2000, it was dominated by a single state-owned enterprise (SOE).¹² Demand was sluggish until the 1990s, but rapidly increased in the first decade of the new millennium. The 1.7 million tons produced became insufficient when government-sponsored infrastructure and integrated housing programs were expanded. Cement shortages became a binding constraint, almost paralyzing the booming construction industry and hindering the development of manufacturing plants. At that time, less than half the demand was being met.

5 For Kaldor's laws, see Kaldor (1967) and Thirlwall (2013). See, also, Szirmai, Naudé, and Alcorta (2013) on current debates on structural transformation.

6 Ocampo, Rada, and Taylor (2009) stated that new activities involve new markets, products, processes, institutions, etc. New activities may be new to a country, but not necessarily to others.

7 The United States and Germany were among the 19th-century latecomers, while Japan, South Korea, and Taiwan are examples of 20th-century latecomers. Gerschenkron (1962) argued that latecomers can catch up by building on the advantage of backwardness and late development, which requires institutional innovations and an active role by the state. See, also, Johnson (1982); Amsden (1989); and Wade (1990).

8 This chapter is based on *Made in Africa: Industrial Policy in Ethiopia* (Oqubay 2015), which is, in turn, based on extensive original research conducted in the three sectors from 1991 to 2015. The research involved primary sources, qualitative and quantitative surveys of 150 firms, site observations of 50 firms, and more than 200 in-depth interviews.

9 See UNECA (2016a, 102–6) for a detailed review of Ethiopian industrial policies.

10 Global production in 2012 was 3.7 billion tons, and China accounted for more than half of it. Moreover, cement is a nontradable commodity with less than 10 percent traded internationally (Oqubay 2015).

11 Capital deepening features a “rise in the capital/labor ratio” and may serve as a basis for new industries (Amsden 1989, 268). On the scale and scope of such industries, see Amsden (1989); Penrose (1995); and Chandler (2004).

12 Mughar Cement Enterprise dominated the industry for almost four decades and continues as a major player.



A child in rural Africa who is curious and joyful. 2016. Zanzibar, Tanzania © 2017. Shutterstock images

Policy instruments

The government designed an ambitious and comprehensive policy to develop the cement industry, while also trying to contain the damage resulting from the cement shortage. First, the government stimulated demand directly and indirectly by adopting various measures. As a provisional solution, close to 4 million tons annually were imported between 2006 and 2011. Cement is highly dependent on transportation, and the government had to import about 1,500 heavy trucks to increase the uplift capacity from port, contributing to the modernization of the transport fleet in the process. The increasing volume of imports and the high profits served as strong signals for new investments in cement. Arguably, this is a typical example of Hirschman's import-swallowing concept, in which imports play creative roles (through demand formation and demand reconnaissance) by stimulating new domestic manufacturing and spurring import–substitution (Hirschman 1958).

Investment incentives were introduced to encourage and induce new investment and productive capacity. For instance, 101 new investment projects were registered between 2003 and 2012, while there were only two projects in the preceding decade. To boost the industry, the government instituted a three-year, zero-income tax incentive, while factory land and raw material quarries (limestone, gypsum, etc.) were made available at nominal prices. The government furnished long-term investment financing at a subsidized interest rate to large-scale producers, specifically for optimum productivity and economy of scale gains.¹³ The Development Bank of Ethiopia (DBE) provided about a quarter of its total loans to the cement industry, and additional financing mechanisms were accommodated, including allowing foreign equity financing to many firms and assisting the SOE through the industrial developing fund (IDF).¹⁴ Moreover, the industry was afforded priority in the allocation of foreign exchange, not only for importing equipment and capital goods, but also for cement imports. The government then banned all imports once the new capacity was sufficient to meet domestic demand.

13 The kiln capacity increased by 250 percent, and the new cement plants had a capacity of 2.3–2.5 million tons, in contrast to the prior 600–850,000 tons per annum.

14 IDF is a special fund organized by the government to finance expansion of SOEs.

As to electricity supplies, the government maintained low electricity costs for cement and other manufacturers and gave the cement industry priority because of its critical effect on public investment programs, such as housing and new energy supplies.¹⁵ Productivity and energy efficiency were far below the competitive cement industries in, for example, China or Pakistan. Gradually, government forced the cement factories to upgrade to coal-fired technology (instead of the more expensive furnace oil), by organizing loan facilities and bulk coal imports through a government agency. Partly from savings achieved through bulk purchases, this assistance reduced logistics complexity and pressure on working capital. With the adoption of coal-burning technology, the industry has experienced substantial efficiency gains (40–50 percent of the cement industry's total expenses stem from energy consumption).

Policy outcomes

Ethiopia's installed cement-producing capacity has increased to 15 million tons, a fivefold growth between 2005 and 2016, making Ethiopia one of the top three producers in sub-Saharan Africa. The rate of expansion was three times faster than the average global growth rate for cement production. The industry has had significant spillover effects for the economy. It is capital-intensive and employs fewer than 15,000 employees directly, though it generates jobs for skilled workers. In addition, the industry has strong employment linkages with the cement-products industry and the construction and transport sectors. For instance, the construction sector has become one of the largest employers, contributing 8.5 percent of GDP in 2015. The price of cement has fallen with the increase in installed capacity and has remained stable since 2012, thereby helping to fuel the construction industry. Domestic manufacturers continue to play a leading role in the Ethiopian cement industry, in contrast to other African countries where multinational corporations usually dominate. The narrow latitude for performance standards in cement production, the perishability of the product, the seasonal nature of the industry, and strong pressure from the construction industry have induced the industry to improve capacity utilization, skills development, and production management.

There were serious limitations and tensions in government policies, however, and these were not without high costs. The 20 percent devaluation of exchange rates in 2010 had a negative impact on

the industry. Energy supplies could not keep pace with expanding demand in the industry, leading to major losses from downtime. Prioritization in financing and foreign exchange allocations starved other sectors. Many small cement factories vanished, as an effect of a policy that favored larger firms and the latest technology that offered productivity gains. A new industrial structure has evolved involving new actors that will henceforth shape the game. These include shifts in the state–industry relationship, which, as noted already, plays a key role in the industry and has significant relationships with its industrial partners. Whereas in South Korea and China the cement industry served as a basis for developing technological capabilities, Ethiopia has missed out on this opportunity, as there were no effective policy instruments to encourage domestic manufacturing of equipment, local content, and local capabilities.¹⁶

This strategic industry would have slowed without the foreign exchange provided by export earnings, which demonstrates the role and impetus from the export sector in supporting an import–substitution industry. Nevertheless, the development of domestic manufacturing may allow for significant savings on foreign exchange requirements. This highlights how export-led industrialization can complement import–substitution (Amsden 1989).

In conclusion, although the industrial policy in relation to cement production has had its drawbacks and costs, the net benefit to the overall economy and structural transformation has been irrefutable. The state played a critical role, particularly through public enterprise, which contributed expertise and production skills and had a demonstration effect. Government policies were the key drivers in the transformation of the cement industry, and its expansion was not based on factor endowments. The government has been able to learn from its mistakes and the new difficulties that arose. While the experience highlights the tensions, trade-offs, hard choices, diverging interests, and complexity of industrial policy, it also shows that an *activist state can, through effective industrial policies, transform an industry* that is strategic to industrial catch-up.

2.3. The tale of two export industries

The aims of industrial policy are the development of manufacturing industries and new activities, and the diversification and

¹⁵ The electricity tariff was 3 US cents per kilowatt–hour in 2010–16, which is the lowest in Africa.

¹⁶ Technological capabilities would include investment in project execution, initial plant erection, and manufacturing of less technologically complex fabrication works. Amsden (1989, 266–7) highlighted that “cement-making never became one of Hyundai's major enterprises. . . . The mill, however, was critical for Hyundai's internal development,” and was the first manufacturing affiliate and first project execution. The process received support from the Fuller Company of the United States [own emphasis]. By 1974, Hyundai had developed capabilities, except “basic engineering” that is left to cement-process specialists. Likewise, in China, the government adopted policies to foster domestic manufacturing capacity, so that the country now accounts for up to 40 percent of cement manufacturing technology worldwide.

expansion of exports. In the Ethiopian context, the leather and leather-products sector has existed for almost a century and is among the government’s priority industries. It is labor-intensive, export-oriented, tradable, and strongly linked with agriculture. Despite the government’s focus on this industry, and despite countless international consultancy studies, the outcomes of industrial policy have not been satisfactory in terms of employment, output, export, and value addition. Meanwhile, the newer agro industrial floriculture sector has demonstrated the gains that may be generated by industrial policy. The rise of this industry, since 2004, is a shining example of how industrial policy should not be confined to traditional manufacturing, but is also applicable to high-productivity agricultural activities (UNCTAD and UNIDO 2011).¹⁷

The floriculture sector (like the leather sector) has benefited from Ethiopia’s natural endowments and competitive labor costs. Floriculture has benefited from Ethiopia’s geographic location, climate

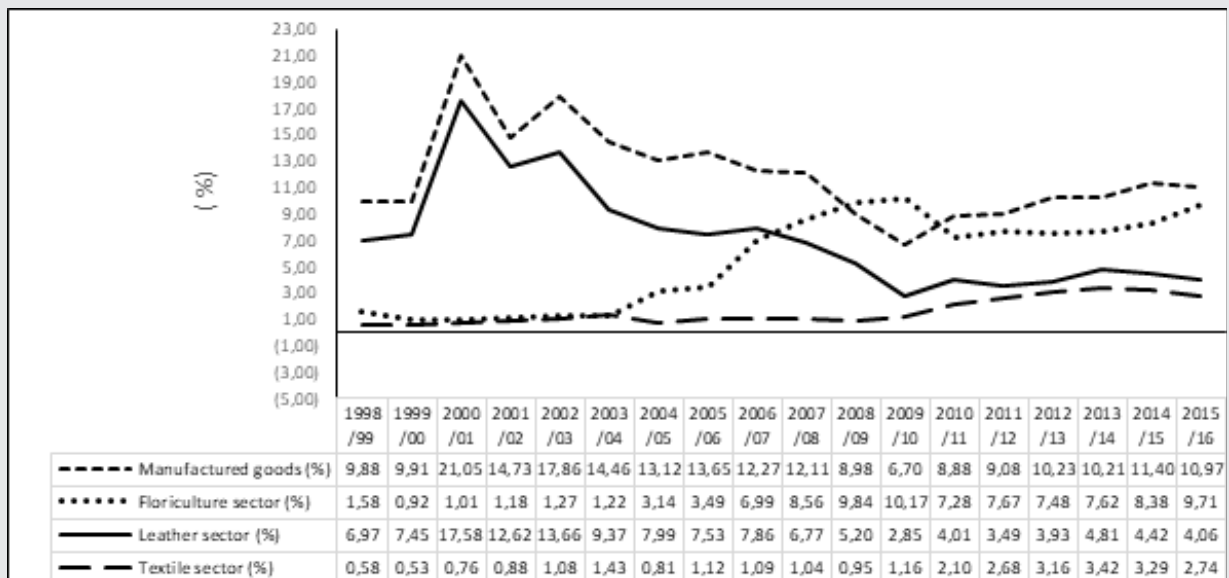
and water, altitude and soil. Between 2004 and 2012, the floriculture sector generated more than \$1 billion in export earnings (Figures 5.1 and 5.2). More than 60 firms operated in the sector, creating direct employment for 50,000 people and indirect employment in the wider horticulture sector for 130,000 people. In 2012, the annual direct export volume reached 50,000 tons, worth \$200 million in export earnings, thereby further diversifying Ethiopian exports and becoming an important contributor to Ethiopia’s tight balance of payments.¹⁸ There has been significant productivity growth, with Ethiopia emerging as one of the top five cut-flower players globally, even if it has a long way to go to catch-up with the Kenyan horticulture industry, which has had 40 years of experience. Learning-by-doing has been significant in the industry, and the sector (both foreign and domestic firms) relies on local skills in production management.

By comparison, between 1992 and 2015, growth of manufactured outputs in the leather sector was sluggish and showed erratic

17 Transformation of agriculture is at the center of the structural transformation inherent in the late industrialization. See, also, Ocampo, Rada, and Taylor (2009), and Thirlwall (2013).

18 The export and employment performance of floriculture has been twice that of the longer established leather sectors.

Figure 5.1: Export shares of manufacturing sector by export value (percent)



Source: ERCA (2016).

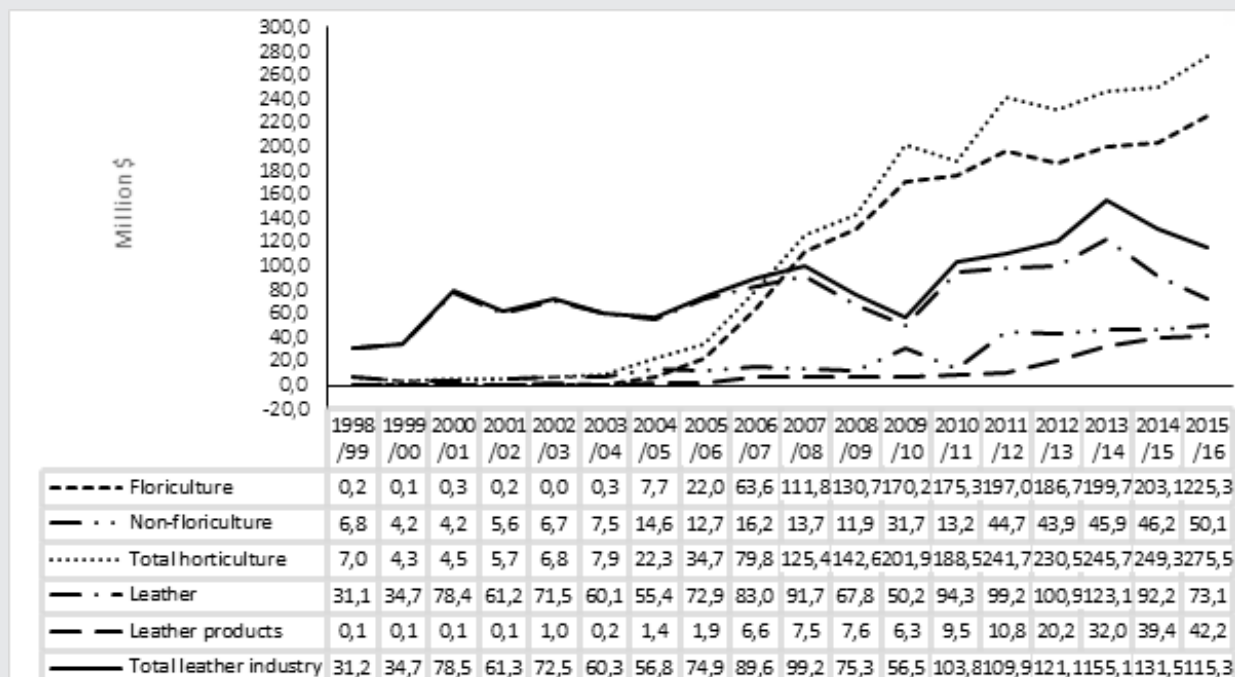
fluctuations.¹⁹ For instance, tanning production between 1992 and 2012 increased from 101 million to 160 million square feet, a very low growth rate. Between 1992 and 2009, footwear production increased from 874,000 to 2.2 million pairs. By contrast, Morocco and Tunisia alone exported more than 54 million pairs in 2010. Ethiopian export earnings from the leather sector rose from \$61 to \$110 million between 2002 and 2011, reflecting the sluggish expansion (Figures 5.1 and 5.2). The sector's 60 factories employed about 20,000 people in 2011, averaging a 4.5 percent annual growth rate between 1992 and 2011. Labor productivity growth has been erratic, with low productivity increases until 2011. Products have been low-value, and progression has been very limited. Despite this, there have been new investments in recent years, and after decades of failure, there is some evidence that policy initiatives have finally begun to bear fruit.

Industrial policy instruments

Although an active industrial policy was applied in both sectors, the outcomes diverged. Support given to floriculture was characterized by more effective coordination and commitment. The government engaged with a limited number of modern firms in the floriculture industry, while in the leather sector the engagement was relatively weak, due to the fragmentation of players and the large number of smallholders who are critical backward linkages. Foreign Direct Investment (FDI) played a critical role in floriculture, as the firms, although largely family owned, were equipped with technology and market capacity. Most domestic industrialists were keen to catch up, despite their limited share in the industry. The government provided suitable land to all firms at an affordable lease rate, primarily within a 200-km radius of Addis Ababa. Subsidized loans were provided to more than 40 firms, both foreign and local, by the DBE. Aligning loan procedures to the specific nature of the industry and a firm's situation, as well as linking financing to performance, were constraints.

19 And this was even though the livestock population in Ethiopia is the largest in Africa and among the top 10 in terms of size worldwide.

Figure 5.2: Exports of floriculture and leather/leather products (million \$)



Note: Since 2012, the government has banned the export of semi-finished leather, contributing to value-addition. Non-floriculture includes herbs, vegetables, and fruits.

Source: ERCA (2016).

The risk for DBE was contained, however, as the predominant players had experience in the industry. Investment incentives and export promotion were applied, and the industry benefited from the devaluation of the currency in 2010. There were limitations in promoting linkages to input (chemicals and fertilizers) production, upgrading technology (especially, new seeds demanded by customers), and expansion of greenhouses and irrigation systems.

Air transport is the largest cost component. The products are perishable and require reliable and regular air transport, which was difficult to achieve in the earlier stages. A cool chain logistics system and phytosanitary standards are also required. The government used the public enterprise Ethiopian Airlines (EAL) to develop its cargo capacity, expand its cool chain storage, and serve the industry. This sector would not have grown without this strategic intervention. The government, together with industry players, also saved the industry when airfreight costs shot up because of the twofold increase in fuel prices in 2008–9. A bold decision by the government was that the treasury to subsidize a third, and EAL, another third of the fuel increase. All employment and export earnings would have been lost if this strategic decision had not been taken. Skills upgrading, environmental standards, and production codes were implemented by the Ethiopian Horticulture Development Agency (EHDA) and the Ethiopian Horticulture Producers and Exporters Association (EHPEA), contributing to the improved performance of the industry. Moreover, this developmental partnership between industry and government was effective in ensuring collective learning.

Despite these positive interventions, major shortcomings and drawbacks are observable in the government's industrial policy. For instance, the government failed to sustain the sector's rapid growth through its failure to provide more land for expansion, a result of coordination failures and political factors. The share of Ethiopian domestic industrialists showed limited expansion because of a failure to introduce effective instruments, despite the existence of this opportunity to sustain growth. Technological upgrading was not sustained through the development of new and improved seeds, which are currently imported on a royalty basis. Moreover, government policies failed to support the development of non-floriculture exports (herbs, vegetables, fruits), whose production was minimal despite their huge export potential. The expansion from the central corridor to new corridors and clusters was very limited, although the airport logistics infrastructure was built. Finally, lessons have not been sufficiently learned from this sector to stimulate manufacturing and other agricultural

subsectors. In short, a golden opportunity was lost because of insufficient commitment by policymakers to provide the necessary support to sustain the sector's growth, with the concomitant failure to design appropriate policies for the sector's growth stage.

In the leather and leather-products sector, similar industrial policy instruments, especially investment and export-promotion incentives, development financing, and privatizing of public enterprises (the major players until 2000) were put forth. New investment flows were dominated by the domestic industry until 2006. Tanneries predominated, with the leather-products subsector too weak to stimulate the sector and unable to sufficiently integrate into the global value chain. The industry faced a binding constraint in the supply of high quality skins and hides, despite the large livestock population. Inadequate governmental focus on livestock development, and the government's inability to transform the raw material value chain, have been major strategic failures. This shows that an effective industrial policy must consider all the components in the value chain and focus on fostering linkage effects.

The quality of skins and hides continued to fall, while prices tripled, magnifying the structural constraint. Industrial players are locked into low-value products, and there is major resistance to industrial upgrading. Lobbied by existing tanneries, the Ministry of Industry imposed a temporary ban on licensing new tanneries on the grounds of a shortage of raw materials. Domestic tanneries preferred exporting semi-processed leather (crusts), while shoe factories preferred producing for the domestic market because of their lack of competitiveness in the international market and limited technological capacity. In contrast to floriculture, the political economy constraints were significant, with the leather association failing to play a critical role in developing the industry. Moreover, the technological and economic characteristics were less favorable, and the latitude for performance standards was wide, thus playing a minor role as a pressure device.

In 2008, the government banned exports of raw skins and hides, favoring exports of semi-processed leather. Three years later, the government decided to ban exports of crusts, to push for exports of finished goods. To this end, the National Export Coordinating Committee (NECC) focused on developing a leather-products industry by attracting new foreign firms that are players in the global value chain. Since 2011, many large foreign footwear manufacturers have invested in Ethiopia, enhancing its exports.²⁰

20 For instance, Hua Jian, which employs 4,000 workers, and Gorge Shoe are building two footwear industrial parks. Leading foreign manufacturers continue to invest because of competitive labor costs, potential sources of inputs (from a longer-term perspective), and duty-free privileges in European and US markets.

Although this was an important policy with strategic significance, the ban was not tied to a comprehensive package of financing, training, and technical assistance for the upgrading of tanning capacity to process finished goods. This was a major failure, as significant tanning capacity became idle, further shrinking exports. The policy decision was supported by footwear firms, but tanneries resisted. Another contradictory policy was the export of live animals, which negatively affected the development of the leather and meat-processing industries. The government faced the dilemma of choosing between foreign exchange earnings from live animals or supporting the manufacturing industry, a choice with structural and political implications.²¹

In conclusion, the industrial policy suffered from a combination of constraints, including the inability to develop backward linkages, political economy constraints, and wide latitude for performance. The leather sector also showed the pivotal role of agriculture and the level of complementarity between manufacturing and agriculture (Cramer and Sender 2015). Despite the apparent familiarization, insufficient understanding of the structure of the industry has contributed to weak policy design and execution. Policy instruments were not supported by reciprocal control mechanisms. Unlike floriculture, the state–industry relationship was weak.

Linkage effects

New industries emerged as an outcome of strong linkage dynamics from floriculture, namely packaging, air cargo, and new growth corridors (although these emerged rather slowly [see Appendix 1]). The industry relies on packaging materials and had to import all its requirements. This demand was a clear signal for new investments. Supports and policy inducements were used to develop a packaging industry, including incentives and standards, and facilitate coordination. Historically, air cargo was not a major business for EAL until 2005. As noted above, government policy led EAL to develop freight and cool chain capacity and to provide a reliable airfreight service, such that air cargo is now a strategic business for EAL.

Research shows that the backward linkage potential in the leather and leather-products sector is strong, while the forward linkage potential is weak.²² The transformation of the smallholder livestock sector was minimal, and there are no large-scale ranches in Ethiopia. Despite the huge backward linkage potential, this experience shows that linkage dynamics are *not automatic* and require effective policy responses.

2.4 Policy instruments and policy organizations

As already suggested, a range of policy instruments has been introduced to support selected sectors, such as subsidized development financing, export promotion incentives (devaluation, duty-drawback, voucher schemes, foreign currency retention), trade protection, investment incentives, foreign exchange allocations, privatization and use of SOEs in strategic areas, and the establishment of a sectoral institute and national exports coordination mechanism. The execution and monitoring of incentives were not uniform, however, partly because some incentives (for instance, duty-drawback or voucher schemes) needed tighter monitoring and more advanced administrative capabilities than others. Devaluation did not require any administrative capacity, while investment incentives were easier to administer than export-promotion incentives. Performance criteria and “reciprocal control mechanisms” were not used properly, highlighting the rudimentary nature of industrial policies.

Despite these shortcomings, floriculture performance did respond to incentives, to a significant degree because the narrow latitude for performance standards strengthened export discipline. This was not the case in the leather and leather-products industry. Monitoring the few large firms in the cement industry was not difficult. It was also evident that incentives had a varied impact on different sectors: for instance, devaluation benefited floriculture but weakened the financial position of capital investment projects, which had to import capital goods. The intensity, concentration, and coordination of support improved coherence and impact, as shown positively in floriculture, and negatively, in leather. The key lesson is that *policy instruments should not be viewed as a menu* to choose from; this is a common misconception. Policy instruments should be used creatively to stimulate the specific industry, based on an understanding of the industrial structure, context, and requirements for monitoring reciprocity. For instance, this means cultivating a cadre of highly trained (PhDs) staff in long-term development finance institutions, with specific knowledge and understanding of specific sectors. Readiness to adjust approaches during execution and to drop instruments when they fail to stimulate the industry is also essential. It also means that policy instruments will need to shift and be upgraded to meet the new demands of the industry (Appendix 1).

Understanding industrial structure

Structural transformation is the shift towards new activities with

21 The pastoralist community relies on selling live animals and the cross-border trade.

22 See international comparisons of sectoral interdependence (based on Italy, Japan, and the United States) by H. Chenery and T. Watanabe, as quoted by Hirschman (1958, 106–7).



Happy school children with their teacher in Africa © 2017. African Development Bank Group

higher productivity, and the industrial policies to achieve this aim (Ocampo, Rada, and Taylor 2009). However, industrial policies cannot be designed without a sectoral approach and an understanding of the industrial structure. Pressure devices can be used, based on knowledge of technological and economic characteristics. The promotion of linkage effects and the role of political economy forces also demand an understanding of the industry, while insertion in the international setting requires familiarity with the industry's global value chain. Policy instruments should be wisely designed, monitored, and flexibly changed, based on an in-depth grasp of the industry.

Policy organizations

The establishment of sectoral agencies and institutes is a critical component in the industrial policy observed in South Korea and Taiwan, where sectoral development institutes have played pivotal roles in supporting specific industries, in terms of export promotion, skills development, research and development, and enhanced coordination. Ethiopia adopted this practice by establishing the Leather

Industry Development Institute (LIDI) in 2010 and other institutes for textiles, food and beverages, pharmaceuticals, and chemicals, etc. EHDA was established based on Kenyan experience and with a push from the industry.

Although the outcomes have been positive, major constraints were observed. Because of weak coordination among government offices, most of the institutes' efforts have been directed to addressing short-term obstacles. Moreover, the institutes were unable to support industry fully because of low-level staffing, in terms of expertise and experience. Twinning with foreign institutes, promoted to develop capacity, has had limited results. Linkages between institutes and universities and technical schools have been weak. Capacity building of the institutes, with a focus on export promotion, skills development, and development of technological capacity, is critical to increased participation by and nurturing of domestic industrialists. The strategic role of these sectoral organizations is crucial to effective industrial policy, and a single agency should serve as a focal point for each sector.

The NECC, chaired by the prime minister and made up of relevant government agencies, was established after 2005. Full-day, regular monthly meetings were held for almost a decade and have played a critical role in addressing constraints in export performance. However, coordination has become the most binding constraint in the execution of industrial policies, despite multiple efforts. Multiple organizations serve industrial policy, such as the Ethiopian Investment Commission (EIC) spearheading investment promotion; the DBE serving as the development financing arm; and also including the Industrial Parks Development Corporation (IPDC) and major regulatory bodies, such as the National Bank of Ethiopia (NBE), the Ministry of Finance and Economic Development, the Ethiopian Revenue and Customs Authority; and SOEs in strategic areas.²³ Developing inter-governmental cooperation mechanisms in very late industrialization requires relentless efforts and a more comprehensive approach.

3. POLICY LEARNING AND INDUSTRIAL POLICIES

3.1 Learning-by-doing and late industrialization

It is argued that learning-by-doing is the primary means of mastering production among late industrializers, and this is equally valid for policymaking. Catch-up can thus be understood as a “process of learning how to compete,” in which *the student* plays a more central role, despite the importance of the teacher (Amsden 1989, v, vi, 3). From this perspective, the aim and role of industrial policies is to advance the pace of learning and to shape its direction. This is achieved by fostering the learning environment through instruments such as the reciprocity principle and export discipline.

Policy learning in Ethiopia illustrates the importance of policy independence and emulation, in addition to learning-by-doing. As the three case studies demonstrate, policymaking is often complex and full of tensions and conflicts, and policy learning was evident throughout the policymaking process. The Ethiopian government designed policies for the different sectors, which were neither complete successes nor complete failure. The experimentation with policymaking thus provided opportunities for new learning from mistakes and successes alike.

3.2 Policy independence

Policy learning is closely associated with policy independence. Despite its profound importance, policy independence may appear to be a blurred concept. Above all, it means:

... the right, and political space, to make policy choices free of political pressure, or at any rate, without succumbing to particular [narrow] interests. From a slightly more unusual perspective, it means reserving the right to make mistakes and, in the process, to learn from them. Policy independence also means the freedom to make major policy decisions that entail risks and bold experiments. Without this dimension, policy decisions will sustain the status quo. (Oqubay 2015, 286)

Policymaking in Ethiopia has been characterized by relative policy independence, including from donors and IFIs. The struggle to achieve this independence was starkly outlined by Stiglitz (2002, 32) “[W]hen I arrived in 1997, Meles was engaged in a heated dispute with the IMF, and the Fund had suspended its lending program ... Ethiopia resisted the IMF’s demand that it ‘open’ its banking system [to foreign banks].” Moreover, the government rejected uniform privatization of public enterprises, reforming public land ownership and “crowding out” the private sector. It also focused on university expansion, despite the advice to focus on primary schools, and expansion of the energy sector. Despite these tensions, the government was an effective partner in mutually beneficial programs, and its implementation record has been remarkable. The decisions noted previously were critical to structural transformation, despite the costs paid.

Moreover, Ethiopia has consistently advocated that African countries should sit in the driver’s seat, with respect to their national development agendas. Not all have followed this advice, even though lack of policy independence has been a major obstacle for many. Curtailment of such independence may arise from many factors, including the Washington Consensus and prescriptions by IFIs and their shareholders. Moreover, the colonial legacy appears to play a role in influencing policymaking in some African countries. Policy independence may also be undermined by interest groups when state power-holders lack legitimacy and the authority to ensure compliance with their decisions across the whole society.

Policy independence does not come free of cost, but the government of Ethiopia could develop its own policies because of domestic political support and the country’s regional geopolitical importance. Clearly, political economy and international factors are at play here.

23 SOEs can play strategic roles if the state is selective and disciplined about fostering their competitiveness and developing technological capabilities.

3.3 Emulation and learning from others

While learning-by-doing is the prime means in policy learning, *contacts* with forerunners and emulation is also a source of successful strategies for catch-up for very late industrializers.²⁴

Emulation is observed in different production and policy areas. Another aspect of emulation, and much emphasized by Amsden, is the importance of role models. East Asian economies (South Korea, Taiwan, and China) seeking to catch-up looked to Japan as a role model, while many African countries have no concrete model to emulate, only others' abstract theories, usually associated with the gurus of Anglo-Saxon capitalism.²⁵

Basic policy documents of the Ethiopian government show that East Asian experiences (South Korea, Taiwan, China) have been important sources of policy learning. There have been links with Japanese and South Korean scholars on industrial policy—the *Kaizen* production philosophy and export promotion (Ohno 2013; Oqubay 2015).²⁶ The transformation of universities and the technical and vocational education system were developed along German lines with the support of German specialists. South Korean experience informed the development of science and technology universities and the establishment of sectoral institutes. The government's recent policies on industrial parks and clustering were primarily based on experiences from China, South Korea, and Singapore. In terms of industrial policies, most—specifically, the reciprocity principle, development financing, export discipline, targeted sectors, and the focus on manufacturing sector—are based on the experiences of East Asian countries (Amsden 1989; Amsden and Chu 2003). Emulation was not only a source of experience and knowledge, but also a source of optimism and motivation. There are risks, however, with emulation in terms of policymaking. Emulation without a strategic perspective and long-term vision is most likely misdirected. Understanding the context is important, including the peculiarities of national or local conditions. That, in turn, requires an analytical mechanism, including both independent scholarly research and the perspectives of policymakers. It should be noted that emulation is *not* synonymous with international benchmarks, which may have limited relevance for the purpose in view. Emulation should, therefore, be viewed as com-

plementary, conditioned to local circumstances to support learning-by-doing, and ultimately tested in experiments.

3.4 Learning-by-doing: Should a country take on big and complex projects?

The ability to make bold policy decisions and undertake complex projects has significant implications for structural transformation. Although such projects may face multiple constraints, they may also offer greater opportunities for learning. This approach contradicts the frequent paternalistic advice by development experts and aid organizations to stay away from big and complex projects. Hirschman (1968a, 129) highlighted the conundrum: "... how will the country ever learn about technology if it does not tackle technologically complex and problem-rich tasks?" He added that "a certain 'unfitness' of the project for a country becomes an additional and strong argument for undertaking it; ... if it is successful, [the project] will be valuable not only because of its physical output, but even more so because of the social and human changes it will have wrought".²⁷

That this perspective has been relevant in the Ethiopian context is evidenced by several large public investment projects, such as in the sugar and chemical industries, expansion of universities and technical schools, railway and energy projects (including large hydro dams), and an integrated housing development program. For instance, the Grand Ethiopian Renaissance Dam (GERD) is Africa's largest hydro dam, generating 6,000 megawatts (MW) at a cost of \$5 billion, financed entirely domestically. It symbolizes the national aspiration to catch up, and it will boost domestic savings capacity by relaxing the balance of external payments constraint.²⁸ Thus, the Ethiopian government has been undertaking extraordinarily challenging projects, in which Hirschman's principle of "the hiding hand" exerts strong pressures and inducements on the government and key players. This may boost the efforts made and learning to ensure that projects do not fail, as the consequences of failure may have significant economic and political costs.

Evidence also suggests that the government was ready to drop major projects when policy decisions were not effective, despite the po-

24 Reinert (2010) stresses that emulation is at the "heart of successful development" and means "imitating to equal or excel."

25 See quote in Oqubay (2015).

26 For instance, Ohno (2013) observed that Ethiopia's "active and responsive industrial policy, trial-and-error attitude, and great attention to sectoral details" are East Asian in origin.

27 This point reminds us that latecomers may pursue new industries that may enhance their comparative advantage. See Lin and Chang (2009) and UNECA (2016a).

28 GERD has stimulated savings and domestic mobilization of resources, which was facilitated by expansion of bank infrastructure. For instance, in 2011–15, branches expanded more than fourfold to 2,868.

litical implications. One such example is the national condominium development program, which was adopted in the wake of the successful integrated housing development program launched in 2003 in Addis Ababa (UN-HABITAT 2011). Lack of demand and economical housing technology, and shortage of resources and its impact on inflation were among the major problems. The housing program in 65 towns was terminated when it was evident that it had failed in terms of employment creation, alleviating low- and middle-income housing shortages, development of the construction industry, and fostering savings and wealth creation. The scarcest resource for the latest of late-comers is the ability to make development decisions, and development is often more complex than we realize (Hirschman 1958). This is a compelling reason to search for possible pressure mechanisms and inducement devices, such as the *latitude for performance standards* in different industries or development projects, to accelerate the pace of learning-by-doing (Hirschman 1967). For instance, the floriculture sector has narrow latitude for standards of performance. The sector's entire production is exported to the European market, which enforces high standards in terms of quality, timely delivery, etc. The perishability of flowers necessitates maximum care, and the industry requires intensive management. Similarly, the latitude for performance standards in the cement industry is narrow, although dislocation from exports allows wider latitude. Where possible, an understanding of the structure of the industry will help to focus on industries with strong linkage effects, thereby offering additional impetus to catch-up. Latitude for performance standards has been an essential instrument, especially given weak application of the reciprocal control mechanism (Amsden 1989).

There have also been serious constraints in and challenges to learning. An important approach used in China's catch-up (particularly, after opening and reform) is effective piloting or experimentation, an approach well captured in the dictums "feeling the stones to cross the river" and "seeking truth from facts." Open-minded pragmatism is critical for learning. In Ethiopia, experimentation has seldom been practiced, although it has been used effectively in a few instances. A one-year pilot program preceded the initiation of the integrated housing program, although the learning derived from it was inadequate. A more successful recent pilot project is the development of Hawassa Eco-Industrial Park. It had multiple aims, from gaining experience in designing and building a world class industrial park in record time, to applying and testing relevant principles and requirements (linking an investment pipeline with the industrial park, infrastructure development with clustering, environmental requirements, etc.). Much experience was gained and disseminated to new industrial parks, and the process was supported by cooperation

between the state and the private sector, with mutual learning to meet the relevant industrial standards and requirements. Piloting and experimentation should be used as the basis for almost all development projects, as its impact on policy learning is lasting.

In addition, policy learning in Ethiopia has been constrained by ineffective institutional support for policy learning. Major constraints include the thin network of research organizations and inadequate experience of using research in policymaking. Research institutions in government offices or at universities have weak links to industries. Yet how can there be a sufficiently long-term perspective for policy learning without reliable data and deep analyses? Policymakers should be encouraged to rely on research to enhance policymaking, and collective and mutual learning between government and industry should be developed. Finally, learning from one's own successes or failures requires a positive attitude and environment.

4. THE CHALLENGES OF STRUCTURAL TRANSFORMATION

4.1 Politics and the political economy of industrial policy

Developmental states have played a leading role in catch-up by late industrializers and are characterized by a grand vision, national mobilization, growth-enhancing management of rents, developmental politics, and embedded autonomy, as evidenced in 20th and 21st century East Asian states (Johnson 1982; Amsden 1989; Chang 1994; Evans 1997; Amsden 2003; Chang 2003; Zenawi 2012). In Ethiopia, politics and political economy have shaped policy outcomes at both sectoral and national levels (Oqubay 2015). Whether a sector is dominated by larger firms or cohesive associations of industrialists or, by contrast, by dispersed smallholders has a substantial impact on the kinds and degree of political pressure that can be brought to bear on government and, hence, on policymaking. Political pressure by social groups depends on their visible presence, strength, and cohesiveness (Hirschman 1968b; Hall 1986). The existing political economy has favored speculative activities rather than productive investments in export-oriented manufacturing (Oqubay 2015). There have been variations in dynamism and the absorptive capacity of the private sector among the floriculture, leather and leather products, and cement sectors. In floriculture, government and industry were a good fit (choosing each other, as it were), building trust and collectively learning. In contrast, in leather and leather products, path dependency (low-value addition and a fixed mindset) and internal fragmentation undermined collective learning (Oqubay 2015). Domestic floriculture firms view FDI firms as sources of technology and market capability, while mutual distrust characterizes the leather

sector. There have been tensions in the floriculture sector, partly because of the largest firm's logistical privileges, but conflicts have been resolved and changes have been negotiated.²⁹

Unlike in South Korea, for example—where the political economy allowed for a concentration of “intermediate assets” among national champions—federalism, ethnic diversity, and a commitment to equitable regional growth make such concentration of rents, industrial clustering, or agglomeration more difficult in Ethiopia. The ruling party's cohesive political and economic thinking has its roots not only in a disposition to learn from the rapid industrialization of East Asian economies, but also in its emergence as a wartime coalition fighting against the *Derg's* military totalitarian rule (1975–91) (de Waal 2012). The government's pursuit of developmental goals, embedded in the “Ethiopian Renaissance” and focused on longer-term public investment, has also been facilitated by continuity of political rule. Its claim to legitimacy has been based, above all, on its support in rural Ethiopia, a legacy of the liberation struggle. This legitimacy is also tied to the country's rapid economic growth and focus on more inclusive rural transformation, which has reduced rural poverty and improved economic empowerment.³⁰

Despite widely recognized economic successes, there has been political discontent in urban and certain rural areas, especially after the contentious 2005 national election.³¹ The increased importance of political and economic inclusiveness, young people's rising expectations, and tensions within ethnic-based federalism remain significant challenges for the government.³² Considering the long history of political fragility, ethnic diversity, and widespread and profound poverty, a commitment to equitable growth and federalism are essential.³³ The government could use this situation as an “internal threat” to further foster its developmentalism and deepen structural transformation to meet popular demands (Doner, Ritchie, and Slater 2005).³⁴

4.2 Climate change and insertion into global value chains

In addition to internal structural constraints, there are significant global trends that impact the country's policies and plans, to which Ethiopian industrial policy must also adapt. For instance, industrialization poses massive perils for the environment, as has been witnessed in advanced as well as emerging economies. In recent years, climate change has become a major global issue, and a consensus has emerged on how to tackle it—for instance, the COP 21 Summit (UNCTAD 2016; UNECA 2016b). Consumer preferences are shifting, putting pressure on firms and governments for increased environmental protection. Ethiopia has adopted a green economy strategy that aims to reduce greenhouse gas emissions by 64 percent. To meet this objective, industrial policies will require the incorporation of measures to mitigate environmental damage and climate effects.

Another key trend is the rise of global value chains, characterized by the expansion of global production networks (Ruigrok and Tulder 1995). The increasing internationalization and concentration of economic activities, in which multinational companies play a pivotal role, is referred to as the “global business revolution” by Nolan (2014). This process has been accelerated by advances in information and communication technology (ICT) and space-shrinking transportation. Global value chains in different sectors are characterized by distinct characteristics (Schmitz 2007). What matters is not openness to international trade but rather the mode of insertion into the global economy, and interconnectedness to domestic linkages (Ocampo, Rada, and Taylor 2009).

4.3 Structural transformation constraints and the way forward

Despite rapid economic growth in Ethiopia, it is evident that progress in terms of structural transformation has been inadequate. Rapid growth has not seen a corresponding shift in the share of manufacturing in employment, output, and exports, and agriculture continues to employ three-quarters of the population and

29 There is also clearly a local political economy whereby, for example, large floriculture firms should make deals with local officials to ensure smooth operations. There have also been conflicts of interest over, for instance, levels of compensation and the accuracy of compensation targeting, so that despite the many “winners” (investors, the balance of payments, indirect beneficiaries such as service suppliers, and employees), there are also losers, including people who may have lost access to land or water, or who may not obtain cheap credit for other purposes because it is directed to floriculture.

30 With a Gini coefficient of 30, “Ethiopia remains among the most egalitarian countries in the world” (IMF 2015, 5). Despite reductions in poverty, food price inflation has impacted the poorest social groups.

31 And, also, as recently as 2016.

32 The expansion and transformation of university education and technical schools has given rise to the challenge of creating hundreds of thousands of professional and technical jobs for graduates.

33 See Hirschman (2013, 74–90) on the “changing tolerance for income inequality in the course of economic development,” for a discussion of how shifting expectations in segmented societies may lead to disappointment and alienation, and the role of the “hope factor” and “tunnel effect.”

34 See Doner, Ritchie, and Slater (2005), who argue for the positive role of threats in developmental states and catch-up. See Chang (1994, 123–7) on the politics of industrial policy in Korea, and Evans (1995) on embedded autonomy.



Nigeria. Lekki Toll Gate © 2017. African Development Bank Group

account for 37 percent of GDP (NPC 2016). Moreover, the sluggish growth of exports has been dominated by low-value and primary commodities, a situation that has, in turn, become a binding structural constraint. The balance of payments constraint has increased as exports fall short of covering the surge in imports, pressing the country to rely on less preferable external resources. With 2.3 million youths entering the employment market annually, job creation is a strategic issue.

The government has recognized that structural transformation is the path to catch-up and for sustained growth. This is an enormous challenge and has profoundly shaped the development of a ten-year plan. The government's *Vision 2025*, which aims to make Ethiopia "the leading manufacturing hub in Africa," puts greater emphasis on expanding manufacturing output and large-scale growth

in industrial employment. This involves an annual growth rate in the manufacturing sector of 25 percent, and a fourfold increase of manufacturing output (from 5 to 20 percent of the **GDP**) and exports (from 12.5 to 50 percent). Manufacturing is strongly associated not only with the creation of *permanent* jobs but also with strong employment linkages by stimulating indirect jobs. This requires the attraction of massive investment in key manufacturing industries, primarily in light and basic industries. To this end, a shift towards a proactive and targeted investment approach has become essential.³⁵ In addition, a better understanding of global value chains has resulted in a focus on attracting leading international buyers as anchors and related international manufacturers.³⁶ New incentives and support schemes have been designed to support domestic industrialists.

35 Opportunities that may positively contribute to the success of the vision include the extension of the African Growth and Opportunity Act (AGOA) until 2025 and the potential relocation of Chinese manufacturing in labor-intensive industries (Lin 2015).

36 Akitumi Kuchiki's "flowchart approach to industrial clusters" model emphasizes the initial agglomeration stage in which industrial parks, anchor firm, related firms and capacity building are involved; later shifting to the innovation stage (Ohno 2013, 70).

Another key policy initiative has been the vigorous and comprehensive promotion of industrial parks and industrial clusters.³⁷ This policy approach contributes to effective environmental protection, rapid industrialization, and development of domestic linkages. Moreover, industrial parks will be specialized to promote linkages, and vertical integration to learning and skills development (Oqubay [forthcoming]). As a learning model, the Hawassa Eco-Industrial Park has been built in record time and to the highest environmental standards.³⁸ Based on this model, a dozen industrial parks are being built along the major railway corridor, thereby alleviating the logistical constraints that manufacturers and exporters currently face, and thereby increasing productivity and profitability by cutting transportation times and costs.

The envisaged “plug-and-play” model of industrial parks serves as an incubator for new domestic industrialists, while working with major international manufacturers creates a learning ecosystem and facilitates learning-by-doing. Industrial parks have been developed by emulating Asia to support structural transformation. They will also enhance prioritization of infrastructural projects and improve the business climate by providing a one-stop service. In the Ethiopian context, this new strategic approach to manufacturing investment and agglomeration is a distinctive feature of *Vision 2025*. Outcomes will depend on effective execution of the industrial policies and the pace and scope of learning. All these attempts further demonstrate policy learning and a pragmatic approach to industrial policy and industrialization, as well as a reenergized commitment to structural transformation and catch-up.

5 CONCLUSION: LESSONS FROM AN EXPERIMENT

This chapter has discussed the Ethiopian experience with industrial policy and performance in the early part of this century. It has done so chiefly by comparing interventions and trajectories in three sectors. Important lessons can be learned from the Ethiopian experiment, and it is hoped that these experiences will add to a broader learning process throughout Africa, where there is increasing interest in researching, designing, and refining industrial policies.

The Ethiopian experiment shows that structural transformation and industrial policy can work in Africa.³⁹ However, it also shows that structural transformation and catch-up are colossal challenges. Next, it shows that industrial policies matter, and the state matters.⁴⁰ Destiny can be shaped by development paths and policies. Despite the dominant prescription that the state should play a minimal or at most a facilitating role, Ethiopian experience shows that structural transformation and catch-up require that the state play a pivotal, strategic part. This includes formulating a vision and strategy, mobilizing the society and its resources around the vision and development projects, managing tensions, and nurturing developmental partnerships.⁴¹

The chapter also shows that, despite growth in all three selected sectors under a single industrialization strategy, performance and policy outcomes were uneven. This highlights the importance for policymakers of understanding and engaging with the interactions and dynamics of specific industries and global value chains, maximizing linkage effects, and having a deep understanding of politics/political economy. All policy decisions are determined through the political process, interest groups, and the state–society relationship (Hirschman 1958; Chang 2003; Whitfield et al. 2015). This has significant repercussions for policy design and execution.

The Ethiopian experience has important implications for policy learning. As Amsden (1989) stresses: “All late industrialisers have *in common industrialisation on the basis of learning*, which has conditioned how they behaved” (emphasis added). This insight applies not only to industrial production, but also to policymaking. The primary source of policy learning has been learning-by-doing, involving both successes and failures, and by “failing better.” Embracing bold experiments and grand projects has had positive learning implications. The Ethiopian experiment also shows that this was possible because of policy independence and the use of coping devices, such as linkage pressures and latitude for performance standards. Emulation in the form of learning from role models was also used in industrial policymaking. For instance, lessons can be learned from

37 Industrial parks and clusters are based on external economies, namely localization that focuses on specific industries and urban economies; and government policies can foster industrial clusters (Marshall 1920; Jacobs 1969; Krugman 1993; Porter 1998). See, also, Stein (2012); Ohno (2013); and Lin (2015) on industrial parks in Asia and Africa.

38 A zero liquid discharge (ZLD) facility has been built. Specializing in apparel and textiles, the park will employ up to 60,000 workers and generate \$1 billion in export earnings. A leading global retailer serves as the anchor, and the industrial cluster enjoys 100 percent occupancy by both domestic and foreign manufacturers. See UNECA (2016b, 195–6) on Hawassa Eco-Industrial Park as an example of green industrialization.

39 Ohno (2013, 36–9) emphasized that proactive industrial policy is based on market forces (under globalization), a strong role for the state, vigorously developing skills, capacity and technology, effective state–private sector partnerships, and deep understanding of the industry.

40 See Mazzucato (2013); Schwartz (2010); UNCTAD and UNIDO (2011); and UNCTAD (2016).

41 See Cramer and Chang (2015) and UNECA (2016b) on meta-structural arguments that view climate, geography, history, or culture as key determinants. The economic history of late industrializers offers many examples of the development paths and policies that lead to catch-up.

East Asia, such as export discipline and the focus on manufacturing, the reciprocal control mechanism, and choice of priority sectors based on productive rather than political criteria.

Industrial policymaking in Ethiopia is a work in progress, but experience there does show that industrial policy can work and thrive in a low-income African country, and that the state can and should play

an activist developmental role. For African countries, perhaps an important point of departure is adoption of a structural transformation perspective, to enable understanding of the strategic importance of manufacturing and exports, as well as their complementarities with agriculture. For, among other things, structural transformation is squarely about transformation of agriculture, rather than leaving it behind.



South Africa. 2015. Xina Solar Plant © 2017. African Development Bank Group

Appendix 1: Summary of industrial policy review in three sectors

	Import–substitution industry: Cement	Export-oriented industry: Leather	Export-oriented industry: Floriculture
Industrial structure			
Labor/capital intensity	Capital intensive	Labor intensive	Labor intensive
Ownership structure	Big corporations	Family business	Family business
Latitude for performance	Narrow	Wide	Exceptionally narrow
Ownership-origin	FDI, SOE, Domestic	Domestic, FDI	FDI (2/3), Domestic
Technology	Process production	Batch production	
Expansion approach	Capital deepening	Capital widening	Capital widening
Linkage dynamics			
Forward linkages	Strong	Weak	Moderate (air cargo)
Backward linkages	Strong (<i>from</i> construction industry)	Huge potential, weak outcome	Moderate (packaging)
Fiscal linkage	Strong	Weak	Moderate
Employment linkages	Strong	Weak	Strong
History	Founded in 1960s	Founded in 1920s	Founded in 2000s
Political economy			
Industry players		Fragmented	Cohesive
Industrial association	Nil	Weak	Dynamic
State–private partnership	Strong	Modest	Strong
Policy instruments			
Investment incentives	Yes	Yes	Yes
Export promotion incentives	NA	Yes	Yes
Development financing	Yes (large firms)	Yes	Yes
Foreign exchange allocation	Priority	NA	NA
Protection–Export ban	Nil	On semi-finished goods	NA
Protection–Import ban	High	Insignificant	NA
Five-year plan	Yes	Yes	Yes
SOE/Privatization	Active SOE presence	Privatized	NA
Sector-specific institute	Established 2014	LIDI–in 2000	EHDA–in 2009
Skills and market support	Insignificant	Moderate	Modest
Reciprocity principle	Weak	Weak	Weak
Policy outcomes			
Production output	High growth	Slow growth	Moderate growth
Export earnings	NA		High growth
Employment creation	Moderate	Weak	Significant
Total economic impact	Significant	Weak	Significant

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SECTION 2

LEARNING FROM EXPERIENCES





CHAPTER 6

INDUSTRIAL POLICY
AND CHINA'S
ECONOMIC
DEVELOPMENT: FROM
THE PERSPECTIVE OF
NEW STRUCTURAL
ECONOMICS

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1. ECONOMIC DEVELOPMENT REQUIRES THE SYNERGY OF “EFFICIENT MARKET” AND “FACILITATING STATE”

Essentially, the economic development of a country means continuous growth of per-capita income (Kuznets 1966; Maddison 2006) on the premise of growing productivity. There are two approaches to productivity enhancement: one is to improve the product quality and production efficiency of existing industries through technological innovation; the other is to allocate existing factors of production, including labor force, land and capital, from existing industries to new industries with higher value added. Based on the analysis of New Structural Economics, both of them require the synergy of “efficient market” and “facilitating state.”

“Efficient market” is essential because only when entrepreneurs are guided to choose their technologies and industries according to the comparative advantages determined by the economy’s factor endowments can they produce the most cost-effective and competitive products of their type in domestic and international markets, maximize the profits of their enterprises, allow the whole economy to maximize its surplus value and accumulation of capital and shift its comparative advantages from labor- and natural resource-intensive industries to capital-intensive industries, and provide the material foundation fundamental to the upgrading of existing industries and technologies to more capital-intensive ones with higher value added. To encourage entrepreneurs to develop the economy as per comparative advantages, one prerequisite is that there must be a pricing system which can effectively reflect the relative scarcity of each factor (Lin 2009). With such a system, for the sake of their own profits and competitiveness, enterprises will choose technologies and industries based on the comparative advantages defined by the factor endowments of a country. Such a system can only exist in a market with perfect competition. Therefore, to develop industries and choose technologies based

on comparative advantages, one prerequisite is to establish an “efficient market.”

A “facilitating state” is also indispensable to economic development. First of all, this is because economic development is a process of structural change where resources have to be allocated from existing technologies and industries to new ones with higher efficiency and value added as factors accumulate and comparative advantages change. In the process of technological innovation and industrial upgrading, there must be an entrepreneur as the first mover. Without other necessary arrangements, the first mover will have to pay all the costs in case of failure and the lesson will let latecomers know where the red flags are and prevent them from making the same mistakes. However, if the first mover succeeds, latecomers will flood in and thus disable the first mover from gaining monopoly profits. Without other necessary arrangements, so to speak, the cost of possible failure for the first mover is out of proportion to the returns if he or she turns out to be successful; whereas for society, useful information can be drawn on by the latecomers whether the first mover succeeds or fails. Therefore, the government needs to incentivize the first mover to take the risk (Aghion 2009). That’s what the patent system does in developed countries. In developing countries, however, technological innovation and industrial upgrading are normally based on international technologies and carried out within an industrial chain. In most cases, they don’t qualify for patenting. Nonetheless, the entrepreneur as the first mover still needs to be incentivized. Naturally, it is necessary to find applicable alternative incentives.

Second, whether the first mover succeeds or not does not entirely rest with his or her own courage, wits and abilities. To venture on a new industry, for instance, they need practitioners with different sets of skills from those in existing industries. If the first mover has to train employees all on his or her own, latecomers can simply lure

the first mover's employees with new skills using higher pay, thus causing a loss to the first mover. To venture on a new industry, the entrepreneur as first mover also needs to raise more funds and take more risks than needed in existing industries, which requires a new corresponding financial system that can mobilize more capital and disperse risks effectively. This is not an issue which can be resolved by the entrepreneur as the first mover alone. As technological innovation, industrial upgrading, capital intensity and economies of scale are enlarged, and the market and value of exchange keep expanding, hard infrastructure, including transport, power and ports, and soft institutional settings, including laws and regulations, have to keep up, which is beyond the first mover's reach. As a country develops, its technologies and industries will catch up with global leaders. New technological innovations and industrial upgrading call for breakthroughs in relevant basic scientific research. As the findings of basic scientific research do not qualify for patenting, for they fall into the category of public products, entrepreneurs are not motivated to conduct such studies. To deal with these issues, it is necessary for a "facilitating state" to coordinate different enterprises, or to provide such services itself. Only in this way can technological innovation and industrial upgrading proceed smoothly.

2. NECESSITY OF INDUSTRIAL POLICY AND ANALYSIS OF THE REASONS FOR ITS SUCCESS AND FAILURE

In economic development, the resources that the government of a developing country can mobilize and allocate are limited and thus insufficient to compensate for the externalities required by all possible technological innovations or industrial upgrading or to improve all relevant conditions. Therefore, like an enterprise, the government also needs to compare possible technological innovations and industrial upgrading opportunities based on their economic and social returns, and aid entrepreneurs in undertaking the ones with the highest returns by pooling the limited resources it has through "industrial policy"; according to one of Chairman Mao's 10 military principles of "gathering one's forces together so as to deal one's enemy a crushing blow." Only in this way can it contribute to economic development in the soundest and quickest manner and steer clear of the "low-income" and "middle-income" traps. Likewise, governments of developed countries also need to provide support for the basic scientific research necessary for new technological innovations and the development of new industries that their entrepreneurs are engaged in. As they don't have infinite funds for the basic scientific research either, they also need to allocate their limited resources based on possible returns like developing countries do.

Such allocation is a type of industrial policy. It is for this reason that Mariana Mazzucato (2011) refers to the governments of developed countries as entrepreneurial states.

The reason why the industrial policies of many developing countries often turn out to be unsuccessful (Krueger and Tuncer 1982; Lal 1994; Pack 2006) is that for the purpose of catching up and surpassing global leaders, their governments tend to back industries following a comparative advantage-defying strategy. As a result, enterprises in such industries can only survive on endless government protection and subsidies, but cannot survive on their own in an open and competitive market (Lin 1999). On the other hand, industrial policies in developed countries often fail because they choose to protect industries that have lost comparative advantage for the purpose of protecting employment. Successful industrial policies must be targeted at industries with latent comparative advantages, i.e., industries that despite their advantageous costs of factors of production are not competitive in terms of total cost in an open and competitive market due to inadequate soft and hard infrastructure and high transaction costs. If the government of a country provides compensation for the externalities for the first movers in such industries and helps them improve "soft" and "hard" infrastructure¹, such an industrial policy will enable industries with latent comparative advantages to grow into competitive industries.

3. FIVE CATEGORIES OF INDUSTRIES IN CHINA AND THE ROLE OF THE GOVERNMENT

At present, China's economic development has entered a "new normal" state. How should a "facilitating state" function in an "efficient market" to promote the upgrading of industries from the medium-low end to the medium-high end, and to the leading edge in the future, so as to realize their sustainable growth at a medium-high rate? From the perspective of New Structural Economics (Lin 2010) and based on the gaps between China's industries and global leaders, they can be classified into five categories. The government should play a different facilitating role in each of them in accordance with their circumstances.

3.1 Catching-up industries

In 2014, China's per capita GDP was US\$ 7,500, while those of the USA, Germany, Japan and South Korea were US\$ 57,101, 44,999, 38,491 and 24,329 respectively. The per capita GDP gap is a sign of

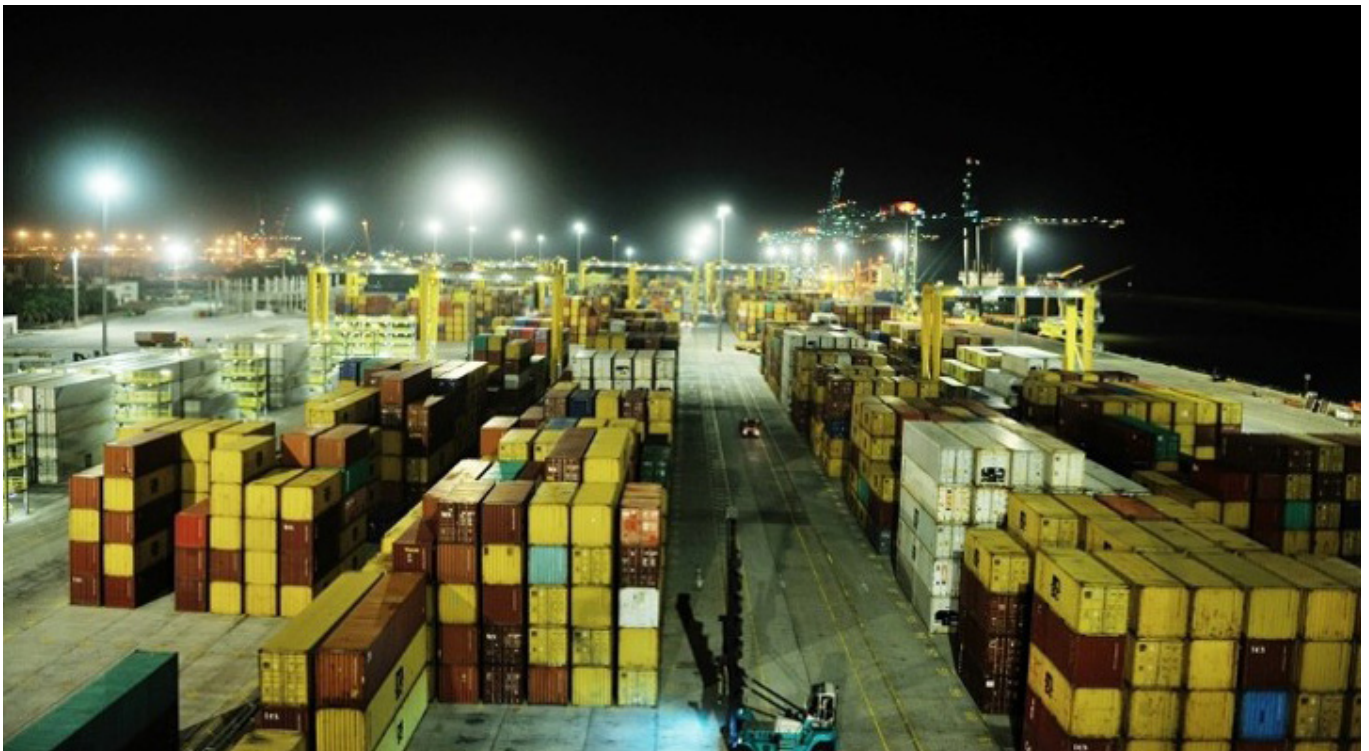
¹ "Hard" infrastructure includes expressways, port facilities, airports, telecommunication systems, power grids and other public utilities. "Soft" infrastructure includes financial systems, laws and regulations, human capital, social capital, value systems and other social and economic arrangements. Please see Lin (2010) for further discussions on their influences on economic development.

China's far lower productivity and shows that the technological level and added value of China's existing industries are inferior to those of developed countries, and that they are still catching up with global leaders. Automobile, high-end equipment manufacturing and new materials all fall into this category.

For catching-up industries, local governments and financial institutions can provide financing and support for access to foreign exchange for relevant enterprises within their respective jurisdictions, so that they can acquire technologically-leading foreign enterprises as a source of technological innovation and industrial upgrading, for example as Chinese firms Geely and Sany do. Since the global financial crisis of 2008, as economic development slowed down in developed countries, a great many technologically leading yet underperforming enterprises have come on sale at low prices, giving rise to plenty of great opportunities for acquisition.

When there are no appropriate opportunities for acquisition available, local governments can also facilitate the enterprises within their respective jurisdictions in building R&D centers overseas so that they can fuel their technological innovation with the help of top global professionals, as Chinese multinationals Huawei and ZTE do.

Moreover, local governments can also select from the high-end manufacturing products imported in large quantities from developed countries to China every year, and based on their respective comparative advantages, attract overseas investment to encourage manufacturers to open plants in China by building necessary infrastructure and improving their business environment. At present, China's GDP accounts for around 14% of the world total. In the new normal state, an annual GDP growth rate above 6.5% means China makes a contribution of nearly 1% growth to global GDP per year. Currently, the world economy is growing by around 3% annually, which means that China's economy accounts for up to 30% of the expanded capacity of the world market every year. If local governments can provide proper infrastructures, personnel training programs, and business and legal environments that befit these high-end manufacturing industries, many foreign high-end manufacturers will be motivated to open plants in China to meet the growing demands of Chinese consumers and manufacture a variety of products in China for markets around the world. A great example in this regard is the Sino-Germany SMEs Cooperation Park in Taicang, Jiangsu, which was designated as a "Sino-Germany SMEs Cooperation Demonstration Area" by the Ministry of Industry and Information Technology in 2012. By the end of 2014, 220 German enterprises had established plants



Togo. 2012. Lome Container Port © 2017. African Development Bank Group

in the park and invested up to US\$ 2 billion in total. We are still in a period of opportunities and can play a positive role in attracting investment in medium-high end industries.

3.2 Leading-edge industries

As a country at the upper-middle level in terms of world per-capita national incomes, China has some industries with globally leading, or even cutting-edge, products and technologies, including white goods, high-speed rail and shipbuilding. To stay global leaders, leading-edge industries must independently develop new products and technologies.

Independent research and development involves two inherently different activities: “development” of new products and technologies and “breakthroughs in basic scientific research” necessary for development. Enterprises can apply for patents for the new products and technologies they develop, so such activities naturally fall into their own scope of duties. By contrast, in addition to high input and high risks, basic scientific research generates nothing but academic papers, which fall into the scope of public knowledge. As a result, enterprises are not motivated to conduct such research.

In the US, a developed country whose industries are mostly world-leading, most of the basic scientific research necessary for technological innovation and industrial upgrading is conducted by colleges and universities funded by the National Science Foundation or by government-funded research institutes like the National Institutes of Health. In other developed countries, such as European countries and Japan, such research is also conducted by similar institutions funded by governments. Naturally, China also needs to provide similar support for the basic scientific research necessary for the development of new technologies and products in its leading-edge industries.

In China, the central government and local governments can set up research funds with financial support for basic scientific research through cooperation between enterprises from the leading-edge industries and colleges, universities and research institutes within their jurisdictions, so as to provide support for development of new products and technologies. They can also provide financial support for enterprises in related industries to help them co-build shared technological R&D platforms through which they can work together to make technological breakthroughs and develop their own new products and technologies separately, based on the breakthroughs. After a breakthrough is made in the development of new technology or product, the central government and local governments can help them realize mass production rapidly by purchasing from them

to reduce their production cost and improve the global competitiveness of their products.

Leading-edge industries need to build sales, manufacturing and customer service networks worldwide to expand their market, which requires the central and local governments to provide them with necessary support in terms of personnel training, financing, legal affairs, consular protection and investment protection.

3.3 Comparative advantage-losing industries

There are two types of comparative advantage-losing industries. One is the industries that have lost comparative advantage, and the other is those that still have comparative advantage in China but suffer from excess capacity.

A typical example of the first type is the labor-intensive export processing sector. Wages constitute its major cost. Currently, an average frontline worker in China earns RMB 3,000-4,000 per month, or US\$ 500-600. By the time the 13th Five-Year Plan period ends in 2020, the two “doubling” targets proposed at the 18th CPC National Congress will have been achieved and CNY will have appreciated against the dollar, which means that the monthly salary of an average worker will rise to at least US\$ 1,000. The loss of comparative advantage in China for such industries is an irreversible trend.

Faced with this challenge, some enterprises in the labor-intensive export processing sector in China can upgrade themselves and shift their focus to branding, R&D, quality control, marketing channel management and other lines of business with higher value added at the two ends of the “Smiling Curve.” However, most can only transfer their plants to other countries with low-paid labor, in order to revive their advantages in technology, management and marketing channels, as similar enterprises did in Japan after the 1960s and the Four Asian Tigers after the 1980s, and in so doing turning part of China’s GDP into GNP. Otherwise, they will inevitably be phased out due to lost competitiveness and in turn lost overseas orders. The success of such enterprises will open up a market overseas for Chinese manufacturers of intermediate components and machinery equipment with high value added in related industries, thus become a driving force for China’s industrial transformation and upgrading.

Most of China’s labor-intensive export processing industries have evolved into industrial clusters in certain cities (counties), and the local governments of the places where these industrial clusters are located can adopt two policies to make the best of the situation. One is to provide personnel training in design and marketing,

and exhibition platforms to encourage capable enterprises to shift their focus to business at the two ends of the “Smiling Curve” and accord the pretax privilege to new product development costs to the enterprises with their own brands, like that accorded to hi-tech industries for their R&D costs. The other is to help the processing enterprises within their jurisdictions go global as a group by providing them with information, overseas management personnel training and capital support and co-building processing and export parks with the governments of the destinations for relocation so as to help the enterprises take advantage of local cheap labor resources to improve their competitiveness to realize revitalization.

According to this proposal, where should we transfer our labor-intensive export processing industries? China is a large country with a population of 1.3 billion, and the third industrial census shows that there are up to 125 million workers in the manufacturing industry. For example, taking Vietnam, Cambodia, Laos, Bangladesh and other less-populated countries; if China’s labor-intensive processing enterprises, even only a handful of them, are transferred there, their average pay would skyrocket as happened in China. In fact, that’s exactly what has been happening in those countries in recent years.

In terms of population and labor supply, Africa has a population of 1.1 billion and there is abundant surplus young labor in its rural areas, similar to the situation of China in the early 1980s. Currently, their average pay is one fourth to one tenth of a Chinese worker’s, which makes Africa the most ideal place for transferring China’s labor-intensive export processing industries. However, for any place to grow into a processing and export base for modern manufacturing industry, in addition to low-paid workers, there must also be local manufacturers with modern management skills and technologies and international buyers’ trust in the local manufacturers’ product quality and on-time delivery. The bottleneck in the development of African countries is inadequate infrastructures and foreign buyers’ mistrust of the capabilities of local enterprises for management, technology, product quality and on-time delivery. If, within the cooperation framework of “The Belt and Road Initiative (BRI)” and “Sino-Africa Community,” the Chinese central government and the local governments of labor-intensive processing industries can help them learn and draw on lessons from China’s practice in investment promotion, build industrial parks, improve their infrastructure, provide one-stop services and attract Chinese labor-intensive processing enterprises there by building industrial clusters, Africa’s economy will also boom.

A great example in this regard is Huajian Group from Dongguan which built a factory in Ethiopia and became an instant success in

2012. The salaries of Huajian’s domestic workers account for 22% of its total cost, while an Ethiopian worker, whose productivity is equivalent to 70% of a domestic worker, is paid only 10% of a domestic worker. The total salaries of its Ethiopian workers are equal to only 3% of its total domestic cost, dropping costs by 19%. All the raw materials of Huajian’s factory in Ethiopia are from China and all the products are exported to other countries, so the logistics cost has risen from 2% of total costs in China to 8%. With the increase of 6% in logistics cost deducted, the cost of its factory in Ethiopia is still 13% lower than its domestic cost. Like many other African countries, Ethiopia is still at an early stage of industrialization and there is still a large chunk of its surplus young labor working in much less productive agriculture and service industries, so its salary level in labor-intensive manufacturing industries will remain much the same for the next ten years or more. As more enterprises relocate their factories there, the scale of production will expand and the logistics cost will be reduced, so the profitability of Chinese enterprises to invest there will be enhanced with the expansion of the scale of production.

As the pay level in China rises, a great many of the Taiwan-, Hong Kong- and South Korea-invested labor-intensive export processing enterprises which were transferred to China’s mainland have been relocated while their Chinese counterparts remain in the country as they are unfamiliar with the investment environment overseas and are lacking in overseas management personnel. Governments of the places where labor-intensive export industrial clusters are located can provide them with information on the countries ideal for the export-oriented processing industry, coordinate with the governments of the places for relocation, and help them draw on China’s practice in investment promotion, build industrial parks, create a sound investment and business environment and play a guiding role along with the industrial associations to facilitate Chinese enterprises in investing there as a group. The Ministry of Commerce, the Ministry of Foreign Affairs and other central ministries of China, as well as the Export-Import Bank of China, China Development Bank, China-Africa Development Fund and other financial institutions, should also provide support in investment protection, visa and finance for enterprises that are going out.

The second type of comparative advantage-losing industries includes manufacturers of building materials, including reinforcing bars, cement, sheet glasses and electrolytic aluminum. Such industries have been growing rapidly in China in recent years, with relatively new machines and equipment, advanced technologies and capacity designed to meet investment demands when the economy was growing at a high speed over the past three decades. After



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China's economy entered the new normal state, its annual growth rate has fallen from 9.7% over the past 36 years to 7.0%, shifting from high-speed growth to medium-high pace growth, which results in excess production in these industries. However, there are acute shortages of their products in developing countries in Africa, South Asia, Central Asia, and Latin America. Just as how the government should facilitate transfer of labor-intensive export processing industries to Africa, the Chinese government can help these industries with excess capacity transfer their production to developing countries covered in the Belt and Road Initiative that have been friendly with China and have a high demand for infrastructure investment. Such investment can both help the manufacturers extricate themselves from the tight corner and contribute to the development of those countries, which makes it a win-win option.

3.4 Short innovation cycle industries

Characterized by high demand for human capital and short development cycles, short innovation cycle industries are emerging

industries. Unlike the medical industry, for instance, where the development of a new drug may take more than ten years and cost up to US\$ 1 billion, in the IT or telecommunications industries it only takes several months or a year to develop a piece of software or a mobile phone. These are short innovation cycle industries with high demand for human capital and short development cycles. For the growth of such industries, China boasts a vast home market, abundant hi-tech professionals and a complete set of manufacturing and processing capacities to transform ideas into products quickly. There are already some successful enterprises, such as Huawei, ZTE, Alibaba and Tencent. Based on their demands, local governments can provide them with incubators, strengthened IP protection, venture capital incentives and preferential talent and tax policies to encourage innovative talent from home and abroad to start their own businesses and promote the development of short innovation cycle industries by making use of China's advantages.

3.5 Comparative advantage-defying strategic industries

In general, such industries are capital-intensive and require a long development cycle and enormous input. China hasn't had comparative advantages yet in this regard. However, their development has a bearing on China's national defense. Large aircraft, aerospace and super computers all fall into this category. One of their features is that their development relies not only on the market, but also on protection and subsidies from the government. In the past, protection and subsidies from the government have been primarily in the form of distorted pricing of various factors and direct allocation. At the Third Plenary Session of the Eighteenth CPC Central Committee, it was proposed that the reform should be deepened in an all-round way to enable the market to play a decisive role in resource allocation and abolish distorted pricing, and such enterprises should be subsidized with direct grants from the treasury. In the US and European developed countries, all strategic industries related to national defense, whether private or state-owned, receive direct grants from the governments for their development of new products and technologies, and the government provides support for their production by purchasing or promoting their products to other countries.

Providing support for strategic industries is an act of the State that should be undertaken by the central government rather than local

governments. However, wherever they are located, they will play an indirect role in promoting technological progress and industrial upgrading of local supporting industries that combine military with civil use. Therefore, local governments can support the development of their supporting industries and improve infrastructure, education, living environment and other soft and hard environments to attract the strategic industries to locate in their jurisdictions, so as to achieve a win-win situation in the transformation and upgrading of such strategic and local industries.

4. CONCLUSION

In the new normal state, China's economy is still in a promising period of strategic opportunities. Based on the characteristics of each industry, both "efficient market" and "facilitating state" should be given full play to enhance industrial transformation and upgrading. Though faced with adverse international circumstances, China's economy is still capable of growing at an average annual growth rate of over 6.5% during the 13th Five-Year Plan period, so that China's per capita GDP will step across the threshold of US\$ 12,615 by 2020 or so, which will make China a high-income country and represent a significant milestone in China's dream to revitalize the Chinese nation.



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CHAPTER 7

BUILDING EFFECTIVE CLUSTERS AND INDUSTRIAL PARKS

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1. INTRODUCTION

Clusters and industrial parks are a worldwide phenomenon, and are the subject of a large body of literature in developed countries. Michael Porter popularized the concept of ‘clustering’ in 1980 through his seminal article *Clusters and the New Economics of Competition*, where he explained the advantages of industrial agglomeration in developed countries. Subsequent studies have primarily analyzed economic agglomeration that spans regions and industries in the context of developed countries, where institutions and infrastructure are relatively well developed (Porter 1990; Saxenian 1994; Markusen 1996).¹

In fact, the ideas behind clustering have a long pedigree. Smith (1776), using the example of linen shirts, illustrated how the putting-out system was widely practiced in the United Kingdom prior to the Industrial Revolution.² The putting-out system was popular not only in the United Kingdom but also in Western Europe. Marshall devoted four chapters in his seminal book *Principles of Economics* (1920) to industrial districts, a term preceding clusters. Similar arrangements have been observed in the Japanese garment industry during the 19th century (Nakabayashi 2006).

Clusters are also ubiquitous in developing countries. For example, in Thailand, the ‘One Tambon, One Product’ program has been widely promoted. Under it, each Thai tambon (subdistrict) is encouraged to develop its industry centering around one key product. The Philippines also adopts a similar ‘One Town, One Product’ program. Long and Zhang (2011) show that the cluster-based model has been a

defining feature of Chinese industrial growth over the past several decades. Sonobe and Otsuka (2006) discuss both the pattern and the mechanism of cluster-based industrialization in Asian countries. Oyelaran-Oyeyinka and McCormick (2007) present nine case studies of clusters across seven African nations, suggesting that clusters are common across the world.

While industrial clusters have been the focus of the cluster literature on developing countries, hometown-based clusters are another type of equal importance. While both types of clusters are related to geographic agglomeration, their specific linkages with geographic location are fundamentally different. The traditional concept of industrial clusters (or even service clusters such as Silicon Valley) is characterized by entrepreneurs operating their businesses within a specific locality. In contrast, entrepreneurs in hometown-based clusters, who are bonded by originating from the same place, do not necessarily operate physically close to each other. The phenomenon of hometown-based clusters is particularly relevant in China, where the concept of hometown is deep-rooted. Theoretically, different sets of social network systems stemmed from social categorizations in different developing countries may suggest that other definitions of clusters might be more relevant. For example, Indians are mainly categorized by caste instead of hometowns. In this case, a more relevant concept could be caste-based clusters.³ Yet, regardless of the definitions of clusters, be they industrial clusters, hometown-based clusters, or caste-based clusters, as they all share a similar set of advantages through the same mechanism, in this paper they are analyzed in the same framework. A case of a hometown-based cluster in

1 See Ciccone and Hall (1996) and Ciccone (2002) for reviews of the clustering effect in the United States and Europe, respectively. See Peters and Fisher (2002) for a review of special economic zones in the United Kingdom and the United States.

2 The putting-out system operated as follows: merchants acquired orders from the market and organized production by outsourcing incremental steps to nearby skilled workers and farmers, who finished the work in small-scale family workshops (Hounshell 1984). The concept of the putting-out system predates the concept of clusters. But, in essence, the two are similar.

3 As an example, in India, over 96 percent of firms in the diamond industry belong to just three caste communities. (Munshi, 2011)

China, where entrepreneurs provide migratory harvesting services across provinces, will be discussed. Understanding the operation of this hometown-based cluster allows us to interpret the steadily growing agricultural sector in China, despite numerous unfavorable conditions. It is an example of a wider observation – through the lens of clustering modes of production many economic puzzles could be logically resolved.

In this paper, we review clusters and industrial parks in developing countries for two reasons. First, compared with the rich body of literature on clustering in developed countries, the literature on the phenomenon in developing countries is scantier. Second, the strategy of creating clusters and industrial parks fits particularly well with certain comparative advantages often found in developing countries.

The absence of formal institutions, such as contract enforcement, is an endemic problem in the developing world. In addition, entrepreneurs face financial constraints when starting and running a business. The task of fixing institutional problems and developing sound financial systems overnight in developing countries is daunting. Despite such challenges, developing countries do have some comparative advantages, such as strong social capital in communities and abundant labor. In close-knit communities in developing countries, people often know each other well and develop strong social trust. Compared with the scarcer financial capital, labor is generally more abundant. Clustering offers an alternative way for developing countries to make better use of their existing strengths (abundant labor and strong social capital) to overcome the seemingly insurmountable financial and institutional constraints.

Marshall (1920) highlighted the three major advantages of industrial districts (clusters): better access to suppliers and markets, labor market pooling, and spillovers of technological know-how. When final-goods and intermediate-input markets are nearby, firms save on marketing and purchasing costs. When a large number of firms work in the same sector, workers are more willing to invest in their skills because they are portable across firms in the cluster. Proximity to other producers enables one to quickly learn the technologies prevalent in the cluster. All these advantages lower the transaction costs of operating a business in a cluster. Apart from the three major advantages Marshall identified, clusters have a few additional

advantages. In clusters, a production process can be divided into many incremental steps, which are undertaken by various family workshops. Such a fine division of labor largely reduces the capital requirement to start a business in each step of production (Ruan and Zhang 2009; Long and Zhang 2011). In addition, due to strong social capital and proximity to each other, businesses in clusters extensively use inter-firm trade credit, which reduces their reliance on external funding for working capital. With a lower starting capital requirement and less working capital constraints, many previously financially constrained entrepreneurs can set up businesses in clusters, enabling them to create more employment opportunities, which developing countries desperately need.

Mainstream economic theory suggests that the frequent subcontracting and fine division of labor within clusters would involve higher coordination costs (Becker and Murphy 1992; Williamson 1975, 26-30). However, in reality it is widely observed that in clusters, thanks to repeated transactions, freely flowing information, and a strong social trust embedded in communities, entrepreneurs rely heavily on relational contracts to get around the problem of weak contracts (Greif 1993; Ruan and Zhang 2009; Long and Zhang 2011). Formal contracts are rarely signed in such clusters. The transaction costs are much lower than previously thought in the literature. Private ordering becomes a major means to sort out contract disputes in the absence of formal institutions.⁴

China's industrialization offers a good example in support of this story. China has become industrialized in just a few decades despite an initial lack of sound institutions and a well-developed financial system. The conventional wisdom in textbook economics cannot explain the puzzles behind China's rapid growth.⁵ Long and Zhang (2011) provide evidence that clustering plays a key role in driving China's rapid industrialization by lowering starting capital barriers and reducing reliance on working capital.

Clusters are often organically formed from existing industries as determined by historical legacy (Miller and Cote 1985). The role of government is normally limited at the initial stage. Yet governments, and in particular local governments, can help facilitate the growth of existing clusters. In some parts of the developing world, clusters are absent. Due to lack of good infrastructure and sound institutions at the national level in developing countries, it is hard to create a

⁴ Private ordering is the process where parties involved, instead of the State, set up social norms for the purpose of achieving various kinds of public goals, such as efficiency, market enhancement, and protection of property rights.

⁵ In fact, developed countries faced the same problem in their early stages of development: small- and medium-sized enterprises in Northern and Western Europe and North America were rarely able to obtain credit from large national or regional financial institutions (Cull et al. 2006).

new industry from scratch on a large scale. Instead, governments or business communities in developing countries often prefer to build industrial parks in a limited geographic area, in which adequate infrastructure and an enabling business environment can be provided. They aim to attract foreign or domestic direct investment in the industrial parks in order to promote employment and facilitate technology transfer. Whereas clusters and industrial parks share the advantages of economic agglomeration, they differ fundamentally in terms of origin, entry barriers, composition of enterprises, and their entrepreneurship impacts on the local economy. The most prominent distinction is the degree of government intervention at the initial stage. In this paper, we review the experiences of and lessons learned from building clusters and industrial parks.

2. BUILDING INDUSTRIAL CLUSTERS

Sonobe and Otsuka (2006) characterize the process of industrial development as taking place in three stages – namely, initiation, quantity expansion, and quality improvement. We can write this intuitively as $0 \rightarrow 1 \rightarrow N \rightarrow Q$. The step of $0 \rightarrow 1$ stands for the initiation phrase; $1 \rightarrow N$ means the stage of quantity expansion; and the quality improvement step can be written as $N \rightarrow Q$, where N and Q refer to quantity and quality, respectively. This section is organized according to the three stages.

8 $0 \rightarrow 1$

Most clusters form organically. To illustrate how historical legacy determines cluster formation, the Chinese example can be explored. Many of the clusters in China nowadays originated from township and village enterprises (TVEs) or state-owned enterprises (SOEs). In the 1970s and 1980s, the Chinese constitution did not recognize and protect private ownership. Largely due to the central government's failure to protect property rights, TVEs blossomed (Xu and Zhang 2009). The TVE governments provided local de facto protection for the TVEs. By registering as a TVE, enterprises could circumvent the problem of weak institutions at the time, and they quickly expanded in response to rising market demand, which resulted from the success of rural reform in the 1980s.

Some workers who grasped the technology know-how in TVEs or SOEs began to set up workshops at home and sell the same product in the market. After observing the success of those private endeavors, other villages followed suit, triggering the birth of a cluster. The footwear cluster in Wenzhou (Huang et al. 2008) is a good example, and we describe its origins in Appendix A. Similar stories can be found in the cashmere sweater cluster in Puyuan (Ruan and Zhang 2009) and the children's garment cluster in Zhili (Fleisher et al. 2010).

The birth of clusters is primarily due to bottom-up responses to expanding market opportunities. The roles of governments in initiating such clusters has been small. More often than not, only after noticing the dynamics of the clusters did the local governments start to facilitate their growth.

Most clusters in other countries also have a historical origin. For example, in Santa Catarina, Brazil, clustering is a prominent feature of industrial production. European immigrants started most of the clusters there. The textile cluster was developed by German immigrants who possessed experience in that trade and arrived in the state in the 1880s (Meyer-Stamer 1998).

9 $1 \rightarrow N$

Because the barriers to entry are low, clusters often initially enjoy a period of fast growth. However, the explosion in the number of businesses in a limited area quickly creates some bottlenecks, such as insecurity, lack of marketplaces, and inadequate infrastructure. Because an individual enterprise will have trouble addressing large, external problems, collective action is needed. Compared with the limited role of individual firms, local governments and the local business community can play a more important role in leading collective action, as the case studies of a cashmere cluster (Ruan and Zhang 2009) and a potato production cluster (Zhang and Hu 2014) in China illustrate. Appendix B describes the establishment of a logistics center in the Puyuan cashmere cluster in China. As the example shows, the local government in Puyuan responded to infrastructure bottlenecks by building a large logistics center through a private–public partnership.

As clusters evolve, bottlenecks arise successively at later stages. New constraints become binding and require continuous tinkering by governments. Indeed, government interventions should differ according to specific situations and be based on a bottom-up, demand-driven approach. Since clusters exist largely at the local level, it is the local government, rather than the central government, that should play the key role in providing necessary public goods and services, thanks to its informational advantage.

10 $N \rightarrow Q$

As clusters expand, the scale of production increases, depressing prices. Consequently, firms in clusters tend to engage in race-to-the-bottom price competitions. It is a great challenge for an individual firm to upgrade product quality because others in the clusters can

easily imitate its new product. Moreover, firms have no incentive to train workers because the trained workers can easily jump ship and go to work for competitors. Local governments can play an active role in shifting the equilibrium of competing for prices to competing for better quality (Sonobe and Otsuka 2006). For example, providing training to workers at the cluster level and encouraging enterprises to establish brand names are possible ways to improve the innovation capability of the cluster as a whole.

In normal times, building up supporting institutions to encourage innovation is hard because the proposed changes likely will produce losers, who will block the changes. Institutional reforms are more likely to occur after a crisis strikes. When a crisis emerges, the opportunity costs of producing high-quality goods – the profits from producing low-quality goods – fall. Based on surveys in clusters in China's Zhejiang Province, Ruan and Zhang (2010) show that collective action related to quality upgrading is more likely to occur after a crisis. This appears to hold true in other developing countries as well: for example, the ban on imports of surgical instruments from developed countries led to an upgrade in quality in a surgical instruments cluster in Pakistan (Nadvi 1999).

However, crisis is not a sufficient condition for a quality upgrade. Not all clusters can transform crises into opportunities and allow for quality upgrading – failures do happen. An insulated mug cluster in Yongkang, China, arose in 1995 and grew so quickly that the excess supply drove prices below production costs by 1996. The crisis came so quickly that collective action could not be taken promptly, which resulted in the collapse of the whole cluster (Ruan and Zhang 2010).

Schmitz (1999) provides another example. In the 1980s, integration into the American footwear value chain allowed an export-oriented leather footwear cluster in Brazil's Sino Valley to improve the quality of its products, its flexibility, and its speed of response. Yet the cluster's exports and profits fell in the 1990s under global competitive pressure since it failed to upgrade in other areas that require coordination between stakeholders. There were two reasons: conflicting interests among entrepreneurial alliances and business associations, and the lack of participation of leading enterprises. This example again highlights how local governments could act as coordinators to lower transaction costs that arise in complicated networks of businesses within clusters.



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The above-cited literature mainly focuses on upgrading processes that occur within localities, especially collaboration between local producers and provision of public goods by governments. External linkages can also be used as a means to spur quality upgrades (Nadvi and Schmitz 1999). When working with global buyers, local producers must follow the often higher-quality standards of foreign buyers. The more stringent global standards pose an imperative for local firms to improve their product quality. For instance, Taiwanese contract manufacturers in the electronics industry used the knowledge they had acquired working for their main global buyer for the purpose of supplying other markets. They even took over other lucrative functions such as process development and product design at later stages (Lee and Chen 2000). A similar story is found in the blue jeans industry in Torreon, Mexico, which performed functional upgrading in the 1990s (Bair and Gereffi 2001).

Like crises, a connection with global buyers is not a sufficient condition for quality upgrades. Bazan and Navas-Alemán (2001) show that customized specification prevents Brazilian footwear suppliers of big US buyers from entering national or Latin American markets. Manufacturing to tight specifications for the main customers requires the whole production plant to gear for that specific purpose. Enterprises wishing to participate have to build up highly developed but narrow capabilities. This hinders their ability to appropriately fine-tune product specifications to adapt to local markets.

3. A CASE OF HOMETOWN-BASED CLUSTER: COMBINE HARVESTING SERVICE CLUSTER IN JIANGSU, CHINA⁶

Despite small farm sizes and rising wages, the agricultural sector in China has been growing steadily in the past few decades. In this section, we examine how mechanization makes this possible and how the clustering mode of production organization promotes the efficient uses of machinery in agricultural production. In particular, an example of a combine harvesting service cluster will be carefully studied as an application of the 0→1→N→Q evolution framework introduced in the last section. While the example is taken from China, the findings and their implications are relevant in the setting of other developing countries such as those in sub-Saharan Africa as they face similar constraints as China in agricultural development (Collier and Dercon, 2014).

In China, rural industrialization and rural–urban migration since economic reforms in the 1980s have pulled labor away from farms. Together they account for the substantial drop of proportion of

employment working in agricultural sector. In 1978, the proportion of Chinese population working on farms was over 92 percent, compared to a significantly smaller figure of 40 percent in 2005 (Lin et al. 2003; McGregor 2005). The shortfall of labor supply logically suggests that the use of machinery complements agricultural production so as to maintain the growth of agricultural productivity. However, given the small farm size averaging 0.5 hectares (ha) (compared to 150 ha in the United States), many hold a relatively pessimistic view towards agricultural mechanization in China (Ruttan 2001; Pingali 2007; Otsuka 2013). They suggest that the tiny farm size inevitably leads to limited use of machinery in different stages of agricultural production; and fragmentation of farmlands worsens the problem.

Nonetheless, agricultural output and yields have been increasing in the past two decades. In 1978, yield was 2.5 tons/ha, compared to 3.5 in 2000 and 4.2 in 2010. Behind the growth of agricultural production is the increasing use of farm machinery among other changes of input composition. According to the Chinese Statistical Yearbook published by the government in 2011, energy consumed by farm machinery use increased from 150 million kilowatts in 1985 to 950 million kilowatts in 2009. The rise of farm mechanization outsourcing service industry could help explain how China achieved increasing mechanization given small and fragmented farmland.

Using the 0→1→N→Q evolution framework, we consider the combine harvesting service cluster in Peixian County in the Chinese province of Jiangsu. Like industrial clusters, at different stage the role of government varies at different stages. The principle that local governments instead of the central government should take the lead in facilitating the growth of the cluster remains true.

11 0→1

The cluster is one of the oldest and largest that provides inter-province mechanization service. In the 1990s, farmers in Peixian County purchased tractors and combine harvesters to complement rice and wheat production. In this case, unlike industrial clusters of which formations are usually bottom-up responses, local government of Peixian County played a determining role in the formation of the cluster. After returning from a study tour to learn about the mechanization experience in Weifang city in Shandong province, Peixian Bureau of Agricultural Mechanization (PBAM) provided the necessary training and market information for machine-owning farmers. With the aims of recouping the high investment cost, these farmers started renting

⁶ This section is largely adapted from Yang et al. 2013 and Zhang et al. 2015.

out their machines and providing harvesting services for farms in neighboring areas in 1998. The convenient physical location is another reason why the cluster that thrives and prospers is in Peixian, but not elsewhere. Being surrounded by a dense transportation network, farmers in Peixian enjoy easy access to the outside market.

12 1→N

At the initial stage, the cluster started with 50 combine harvesters primarily supported by PBAM. Each is operated by three or four people. To recoup the investment cost of the machines, they began to provide service across provinces. On average, an owner of a combine could make 60,000 yuan profit, which was many times higher than income on farms at the time. The news of the fruitful and profitable expeditions quickly spread across Peixian. It attracted others in Peixian to imitate it and become entrepreneurs specialized in providing harvesting service, resulting in exponential growth of the combine harvesting cluster. In a sense, the channel through which this hometown-based cluster expanded matches that of the Wenzhou footwear industrial cluster described in Appendix A, mainly the copying of others.

The role of government agencies evolved as the cluster expanded. Facilitation of the growth of the cluster becomes the key. Since the cost of a machine is prohibitively high, until 2004 only the wealthier families in Peixian were able to enter the cluster. In that year, the government started providing subsidies to help less wealthy families participating in the expanding cluster.

As the scale of the cluster made it impossible for PBAM to escort all the entrepreneurs on the job, it alternatively encouraged entrepreneurs to team up and 'go-as-a-group'. For example, receiving the complaint that operators spent a large sum on phone calls and messages for coordination of team production activities, PBAM reacted by setting up a group message platform for the harvesting teams in collaboration with a telecommunication company. Unlike entrepreneurs in industrial clusters, not all entrepreneurs in the hometown-based cluster are physically close to each other due to the migratory nature of the service. In this context, the strategy of go-as-a-group has several advantages, including but not limited to greater bargaining power with local agents, pooling spare parts for repairing, sharing the client-searching costs and enabling greater

competency to cope with harassment and extortions from local gangs.

As more entrepreneurs entered the cluster, they started to travel further away to provide harvesting services. The fact that China is a big country with varying harvesting seasons makes all-year-round operation physically possible. Since the harvesting windows are narrow in general, combine harvesting service providers from Peixian compete with local service providers relying on provision of timely services. The distribution of nationwide harvest calendars by PBAM allows the entrepreneurs to catch the narrow harvesting windows. These altogether account for the quick expansion of the clusters. In 2013, it had more than 1,000 combine harvesters operating in 12 provinces throughout the year.

4. BUILDING INDUSTRIAL PARKS

The major difference between building clusters and building industrial parks is the degree of government intervention at the initial stage. Whereas industrial clusters usually form organically without government intervention, industrial parks are initiated by governments to jump-start economic growth in a specific geographic region. Since improvement of the business environment of the country as a whole is neither economically nor politically viable, governments in developing countries often prefer to build industrial parks on a smaller scale. When constructing an industrial park, the government aims to attract investment by offering potential entrants geographically limited benefits of various kinds. UNIDO (1997, 10) defined an industrial park, or the more general term *special economic zone* (SEZ),⁷ as 'a tract of land developed and subdivided into plots according to a comprehensive plan with provision for roads, transport and public utilities with or without built-up (advance) factories, sometimes with common facilities and sometimes without them'. In addition to hard infrastructure, industrial parks often grant preferential policy and have different institutional arrangements from the rest of the country – such as tax and tariff reductions, looser labor regulations, different sets of laws, and many other practices that provide convenience and lower the costs of doing business.⁸ While the policy instruments that governments could use to lure investment are well-known, there are a few strategies they could follow to increase the chances of success: targeting international firms, targeting grouped businesses, incentivizing first movers, and adopting a step-by-step approach.

7 In this section 4, the terms are used interchangeably for convenience.

8 See Aggarwal (2005) for a review of fiscal incentives provided by governments in India, Sri Lanka, and Bangladesh.



South Africa. 2015. Xina Solar Plant © 2017. African Development Bank Group

4.1 Targeting International Firms

The high lump-sum costs of investment suggest that firms operating in industrial parks in developing countries are generally large in size. Because domestic markets in developing countries are often in their infancy, they often cannot absorb the production of firms in industrial parks. It is therefore more reasonable for industrial parks to target firms that bring in international market orders from abroad; doing so has a few advantages. First, firms in the industrial parks can focus on their production without worrying too much about the thin domestic market. Second, many global buyers provide intermediate inputs for their orders and just put out the assembly step to domestic firms. Firms in industrial parks in developing countries are therefore less subject to the supply-chain problems inherent in many of them. Over time, as domestic markets grow and as firms build their reputation locally, they can gradually expand their domestic market shares and subcontract more tasks to other domestic firms, even outside the industrial parks. In doing so, they generate positive technological spillover to existing firms and contribute to overall economic growth (Glaeser and Gottlieb 2009; Greenstone et al. 2010).

4.2 Targeting Grouped Businesses

Given the limited number of multi-establishment firms, the strategy of targeting only fully vertically integrated firms may not always be viable. As industrial production needs upstream and downstream supply chains, it is often hard for a small- or medium-sized firm to survive in an isolated place. As a result, the go-as-a-group model has come into being in recent decades: a powerful enterprise or business association takes the initiative to establish an overseas trade center and industrial park, as a means of attracting domestic enterprises to go-as-a-group. Some advantages of the go-as-a-group strategy are mentioned in the hometown-based cluster example given in the last section, such as promoting security and lowering client-searching costs. In the context of industrial parks, the use of the strategy has some additional upsides. It enables the maintenance of the original production connections overseas by investing as a group of upstream and downstream production enterprises while preserving the domestic industrial chain in the host country. Such a strategy has several advantages for enterprises in the group: achieving market internalization

of intermediate products, formulating internalization advantages, reducing international market risk, reducing export tariffs, and optimizing the international investment environment. During trade-dispute settlements, the grouped enterprises can negotiate and resolve trade quarrels with better bargaining power.

We offer the example of Yue Mei, a Chinese textile and garment company. In 2004, Nigeria banned the import of textile and garment products from China. Yue Mei in response planned to set up a processing plant in Nigeria but soon realized that the incomplete supply chain would make it hard to survive as an isolated business in the foreign business environment. In 2007 Yue Mei invited 15 upstream and downstream enterprises originally from China and invested US\$50 million to set up a textile and garment industrial park in a Nigerian free trade zone (Yue Mei Group 2009). Governments in developing countries might exploit the increasingly popular use of the go-as-a-group strategy by private enterprises, and target such groups of foreign businesses.

4.3 Incentivizing First Movers

Rodriguez-Clare (2007) and Lin (2011) emphasized the importance of ensuring that place-based development programs are compatible with comparative advantages. Although the principle is clear, there are few clues as to which industry a government should support. Mapping from principle to action is not an easy task for a government. Instead of relying on governments to pick winners, an alternative strategy is to encourage private enterprises to discover a profitable business model. The process of cost-structure discovery poses massive positive externality. Once first movers figure out a profitable business opportunity, others can easily imitate it. Therefore the first movers cannot capture the positive externality. Being aware of that, firms are often reluctant to be first movers, lowering their chances of discovering new business models and resulting in socially less-than-optimal outcomes. It makes economic sense to subsidize the first movers (Hausmann and Rodrik 2003; Lin 2010) by offering them special treatment – such as tax breaks and free land. However, to avoid rent-seeking behavior, there needs to be a stick in the incentive program: it ought to be designed with a predetermined exit strategy, and linked directly to individual company performance or a time window. Whereas elements of both carrot and stick are present behind the success of cluster-based development in East Asia, Latin America has had ‘too much of the carrot and too little of the stick’ in its industrial policies. This could

explain the discrepancy of industrial growth between the two (Rodrik 2004).

4.4 Step-by-Step Approach

Xing and Zhang (2013) suggest that the successes of place-based policies in China are characterized by a gradual approach coupled with an experimental mentality. The development of China’s SEZs have followed a step-by-step approach: first came Shekou industrial park in 1979 (only 11 sq. km), followed by the larger-scale Shenzhen SEZ (328 square kilometers) in 1980, followed by 14 coastal opening-up cities in 1984, and culminating in China’s joining the World Trade Organization in 2001. But building industrial parks (or SEZs) is a new endeavor for many governments, and they are concerned about potential failures and negative spillovers. By starting small, governments can learn whether the idea of the industrial park works on local soil. If it fails, the negative spillover effect is limited to a narrow area. If it succeeds, it will boost governments’ confidence to scale up industrial parks to wider regions. Malaysia, Jamaica, Kuwait, and Jordan have adopted this gradual and experimental approach in testing the impacts of SEZs (Akinci and Crittle 2008). As an extreme case, Honduras in Central America has gradually increased the scale of its SEZs since the 1970s, and the government declared the whole country a ‘free zone area’ in 1998 (Farole and Akinci 2011).

4.5 Industrial Park Failures

Despite evidence that confirms the positive impacts of place-based policies in China and other countries, such as Indonesia, Malaysia, Sri Lanka, and South Korea (Jayanthakumaran 2003), such policies have failed in other locales.

The political economy of land poses challenges to Indian’s SEZs. Legal restrictions remain and discourage private developers from assembling necessary areas of land for development. The Indian Zone Authority was not granted autonomy over zone development and approval clearance until 2005. Despite the launch of the 2005 SEZ Act, state governments and public-sector actors retain significant control over land procurements and transactions. Due to the strict legal enforcement, including of land ceiling and land use clauses, private developers need governmental patronage for land acquisition (Seshadri 2012). Even if they succeed, the size of a zone is limited to 5,000 hectares (Mitra 2007). Conflicting interests over land acquisition between citizens and firms operating in industrial parks is another hindrance.⁹ Issues of dislocation and rehabilitation, coupled

⁹ In 2008, with the aim of mass producing the Tata Nano, the world’s cheapest car at the time, the Indian vehicle manufacturer Tata Motors established a factory in an SEZ in Singur, West Bengal. The West Bengal government offered compensation to more than 10,000 farmers and acquired 1,000 acres of land for the project, while another 2,000 farmers refused. Their protest ultimately forced Tata Motors to abandon the plant. The protest in Singur is merely one of the many cases reflecting the wider problem in the implementation of place-based policies in India: industrialization needs land but local farmers are not willing to give it up (BBC 2008).

with the fact that India is a democratic country, make the problem even more complicated.

Similar to the Indian SEZs, which are managed by public-sector actors, the industrial zones in Egypt are managed by the central government. The failures of Egyptian industrial parks stem from information gaps between the central government and grassroots entrepreneurs. The bureaucratic SEZ system constitutes numerous layers and leads to a mismatch between government and SEZ firms. Worse still, as the zone policies evolve from time to time, SEZ firms must expend unnecessary energy to understand and deal with repetitive policy changes. In contrast, Zeng (2010) attributes the success of China's SEZs to the active and pragmatic facilitation of the local governments and a strong commitment by the state. As demonstrated by Shenzhen, China's first SEZ, fiscal decentralization incentivized better-informed provincial and municipal governments to tailor policies and regulations to local needs, such as providing a sound judicial system, constructing infrastructure, and granting preferential policies.

A number of others failed for less complicated reasons. For example, an export processing zone in Senegal was unable to blossom because of high electricity costs, expensive labor, excessive bureaucracy, and lack of transportation infrastructure (Cling and Letilly 2001). In general, the studies on the failure of industrial parks and SEZs are scant. More research is needed to understand such failures.

5. GENERAL REMARKS

Clusters and industrial parks are location-specific. Because of an informational advantage, local governments are in a better position than the central government to identify the bottlenecks that afflict

clusters and industrial parks and figure out solutions. As clusters and industrial parks evolve, new bottlenecks emerge, requiring new solutions. This in turn calls for continuous tinkering by local governments. It is important to place local governments and business communities in the driver's seat of local economic growth so that they can watch out for and adjust to bumps in the road. However, it is challenging to strike a balance between autonomy and embeddedness (Rodrik 2004): to reduce corruption requires the maintenance of government autonomy with regard to private interests, but to elicit information from the private sector, the government should be embedded in a close relationship with it.

China has used fiscal decentralization and evaluation of officials' performance as the major instruments to align local officials' incentives with local economic development (Xu 2011). An essential element of the fiscal decentralization in China is that career competition between regional officials at the same level is based on fiscal performance, which effectively mitigates the problem of incentive misalignment. However, the incentive design used in China may not apply to other countries. Due to differences in institutions, the forms of incentive mechanisms are likely to vary across countries and over time.

In a country with strong state capacity like China, it is not an issue to earmark a certain area as an industrial park and provide it with favorable policies and infrastructure. But in some democratic countries, it may not be legitimate to offer special treatment to certain locations. The industrial park concept does not necessarily transmit well to all developing countries. It is necessary to bear in mind the limitations that apply to using the creation of industrial parks as a policy instrument to foster industrial development.

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Appendix A: The Origin of the Wenzhou Footwear Cluster

At the beginning of the 1980s, when China began its transition from a command economy to a market economy, footwear products were in seriously short supply. The strong market demand prompted many employees of state-owned or collectively owned footwear factories to set up their own footwear stalls or family workshops and produce whole shoes by themselves. Due to the highly technological requirements for whole-shoe production, most of the early newcomers to the industry were former technicians from the state or collective firms.

A good example of technical diffusion may be seen in the state-owned Dongfanghong Leather Footwear Factory, which gave rise to three major enterprises, namely Jierda Footwear, China Aolun Shoes, and Wenzhou Dashun Footwear Machinery Manufacture, as well as many smaller enterprises, such as the Tailong Footwear Last Factory. Having the experience of apprenticeship was found to be a major asset in setting up shoemaking businesses. The most prominent example of that is Yu Ashou, the founder of Jierda Footwear. Yu had 16 apprentices, 15 of whom set up their own companies, while the last one became his son-in-law and worked in Jierda Footwear.

Copying and spin-offs further increased footwear production and the rate of technological diffusion. Aokang and Hongqingting are two typical examples of spin-offs. Wang Zhentao and Qian Jinbo first worked as carpenters and later sold shoes together until 1988, when they co-founded a leather shoe factory. In 1995, the factory split into the Aokang Group and the Hongqingting Group, which still exist today. After the split, both groups grew into leading footwear companies. The formation of an industrial cluster is a process of production and technological diffusion through the copying of others. The success of one enterprise often lures others to imitate it, resulting in numerous enterprises being duplicated. As far as Wenzhou's diffusion channels are concerned, this process was accomplished primarily through relatives and friends.

Adapted from Huang et al. (2008)



Different transportation options somewhere in Africa. © 2017. African Development Bank Group

Appendix B: **Building a Logistics Center in the Puyuan Cashmere Cluster**

As production grew, so did the volume of transportation into and out of Puyuan. Initially many small, private logistics companies, each operating only one or two routes, served the cluster. It was not economical for each transport company to build separate loading docks and parking lots, meaning that trucks often blocked the streets when loading goods. Some of the companies even hired thugs to fight for the most lucrative routes. In 1995, to reduce chaos and improve efficiency, the local government intervened and organized 27 private logistics and transport companies into a shareholding company with the local government as the largest shareholder. The company invested 40 million yuan to build a logistics business center, a loading dock, a 150,000-square-meter warehouse, and a parking lot. The company has auctioned off 109 routes to more than 140 major Chinese cities to private investors. Although the company would seem to have a natural local monopoly, shipping costs through the Puyuan logistics center have decreased since the company's inception. This may be due to competition from the neighboring Honghe Township's logistics center.

Adapted from Ruan and Zhang (2009)





CHAPTER 8

CHINA'S FINANCIAL
MECHANISMS
IN INDUSTRIAL
DEVELOPMENT WITH
INSPIRATIONS FOR
AFRICA

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1. INTRODUCTION

In the past three decades, since the beginning of reform and opening up of China's financial system, its industrial development has seen great achievements in expansion, diversification, transformation, and upgrade of industries. The interaction of multiple factors, among which is the financial factor, has been indispensable to these achievements. This paper aims to discover how finance has supported this process. Unlike research focusing on specific financial instruments and policies, I start from a comparison between China and other developing economies, so as to give a brief overview, from a systematic perspective, of the financial mechanisms active in China's industrial development from a systematic perspective.

Compared with most developing economies, China shows two distinctive characteristics in terms of financial and industrial development: the financial system is on a large scale, with strong deposit mobilization capabilities, maintaining its stability over the long term; manufacturing and Internet industries have experienced rapid growth. This paper, thus divides the investigation of "how finance supports industrial development" into two specific areas: (1) how China developed its financial system and acquired the precondition for allocating large amounts of funds; (2) what kind of mechanism has attracted domestic and overseas financial systems to invest large sums into China's manufacturing and Internet industries.

The structure of this paper is as follows: Section 1 introduces China's financial development mode of "financial restraint" and "online balance sheet repair." Section 2 explains the role of the continuous increase of collateral value in promoting the manufacturing industry and that of fundraising from the equity financing market in promoting the Internet industry. The last

section discusses how China's mode of finance supporting its industrial development might provide inspiration to Africa.

2. CHINA'S FINANCIAL DEVELOPMENT MODE: FINANCIAL RESTRAINT AND "ONLINE BALANCE SHEET REPAIR"

2.1 The Rapid Expansion of the Scale of Financial Industry and Maintenance of Stability

The precondition for providing efficient support to industrial development is to have in place a basically stable financial system, which features strong deposit mobilization capabilities, and to be able to allocate large amounts of funds. Compared with most developing economies, China has shown a remarkably rapid development in its financial system, and its financial industry has maintained a basic stability over the long term, which has created a solid foundation for China's industrial development.

In terms of absolute scale, by the end of 2016, the assets of financial institutions in the banking industry had reached RMB 232 trillion, more than a thousand fold increase over the 1978 figures, and the aggregate financing to the real economy was up to RMB 155.99 trillion, an increase of 800 times (see Figure 8.1).

Moreover, the domestic credit-to-GDP ratio provided by the financial sector has dramatically increased on the whole. In 1978, the ratio was 37.9 percent in China, with only a small gap between it and other developing economies, including India, South Africa, Turkey, and Brazil. However, in 2008, the ratio rose to 118.7 percent in China, presenting an increasingly large gap between it and other major developing economies (see Table 1).

In terms of financial stability, at the end of the 20th century and beginning of the 21st century—a period considered to be the toughest,

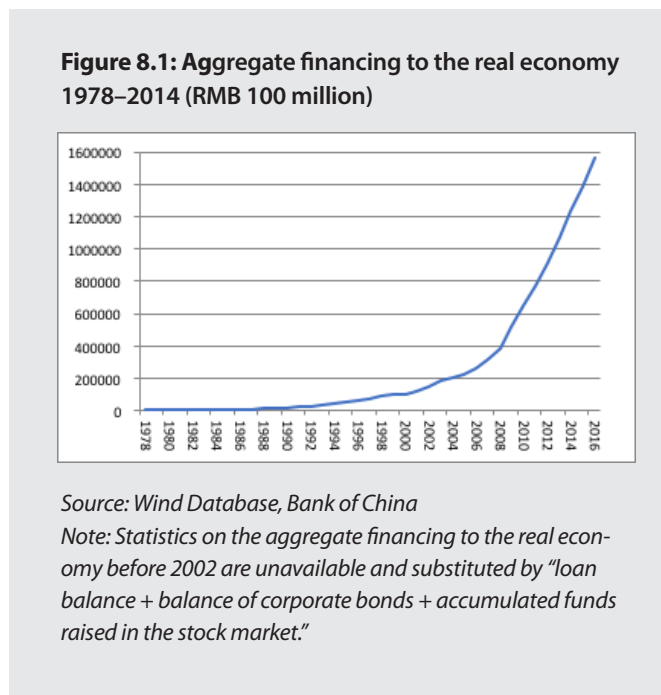
in terms of the Asian financial crisis, with state-owned enterprises facing difficulties in their operations and other factors—China’s banking industry saw its non-performing loan (NPL) ratio reach around 30 percent at one time, and the banking industry was considered to be on the brink of technical bankruptcy. However, China’s financial system basically maintained stability and normal financing functions. From 1998 to 2002, the loan balance of the banking industry increased continuously, rising from RMB 7.49 trillion at the end of 1997 to RMB 13.13 trillion at the end of 2002, with an average annual growth of 11.9 percent (see Figure 8.2).

2.2 Rapid Expansion of the Scale of the Financial Industry: Financial Restraint rather than Financial Repression

Financial restraint (Hellmann, Murdock, and Stiglitz 1997) is the main reason that China’s financial industry has maintained rapid growth on the scale that it has (Zhao and Zhu 1995), and was widely used by the economies that created the “East Asian Miracle.”

Since the beginning of reform and opening up of China’s financial system, many people have portrayed it as “financial repression” (Bai and Qian 2009; Feyzioğlu 2009; He and Wang 2011; Kong 2011; Johansson 2012). Actually, this is a misunderstanding, because there are remarkable differences between China’s financial system and the typical financial repression system (Shaw 1973; McKinnon 1973), in terms of policy goals, instruments, degrees of intervention, and policy effects (see Table 2).

According to Hellmann, Murdock, and Stiglitz (1997), the core of financial restraint lies in creating rent opportunities and enhancing incentives for banks’ deposit mobilization and granting of loans. It features three policy instruments: interest spread protection, restrictions on entry, and asset-substitution restrictions. Among



them, the first plays a major role, while the latter two are supplementary.

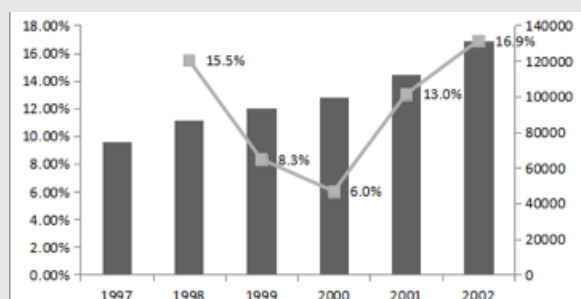
Interest spread protection refers to setting the deposit rate below the competitive equilibrium level, to create rent opportunities by generating a spread between deposit rates and loan rates so as to provide incentives for banks. In October 2015, before the benchmark deposit rate ceilings were completely lifted, China had strict regulations on the deposit interest rate ceiling. Though the real deposit interest rate is positive on the whole, the interest spread was maintained at a certain level for protection. This was also the main reason for rapid

Table 8.1: Financial scale of major developing economies—domestic credit provided by financial sector (percentage of GDP)

	China	India	Brazil	Russia	Nigeria	Turkey	Indonesia
1978	37.9	33.1	45.5	n/a	21.6	35.7	19.9
1985	65.2	46.7	50.9	n/a	43.4	39.9	16.6
1990	88.4	50.0	87.6	n/a	21.9	19.5	50.3
1995	86.9	42.9	54.9	25.5	23.6	27.8	51.8
2000	118.4	51.2	70.7	24.9	10.0	37.9	60.7
2008	118.7	69.8	85.9	24.4	26.6	54.6	36.8
2015	194.4	76.7	108.7	54.5	23.1	92.9	46.7

Source: World Bank

Figure 8.2: China's loan balance and its growth from 1997 to 2002



Source: Wind Database, Bank of China (accessed February 17, 2017)

Note: Columns: Loan balance (RMB 100 million, right axis); grey line: loan growth rate

growth in profits and an incentive for further expansion after China's banking system gradually, beginning 2003, emerged out of the condition of having a high NPL ratio.

Restrictions on entry refer to the restricting of entry of financial institutions to preserve rents generated by the policy of interest spread protection. China imposes strict restrictions on entry to maintain financial stability, due to lack of an exit mechanism. Aside from rural banks, city commercial banks set up as urban credit cooperatives, rural commercial banks, and rural cooperative banks set up as rural credit cooperatives, only one depository financial institution, namely, China Minsheng Bank, was newly opened to the public from 1996 to 2013 in China.

Asset-substitution restrictions refer to the restriction of financial products development that could substitute for deposits, to prevent any competition between them and keep the deposit interest rate below the competitive equilibrium level in the long run. It has always been the goal of China's financial policies to develop a multi-tiered capital market and to provide varieties of financial products. However, China still has asset-substitution restrictions, but with no specific policies, because of the backward development of fixed-income financial products, which involve low risk, yet high income, objectively speaking, The rapid development of banks' wealth-management products and funds in the monetary market did not exert a significant impact on the deposits until 2010. The distribution of household financial assets indicates that deposits in banks have

Table 8.2: Financial restraint vs. financial repression

	Financial restraint	Financial repression
Policy goals	To provide financial and production sectors, especially the financial intermediaries (banks), with "rent opportunities," curtail a bank's moral hazard behavior, induce financial intermediaries to increase the supply of goods and services that might be underprovided in a purely competitive market, such as monitoring of loans and attraction of incremental deposits	To extract "rents" from the private sector
Policy instruments	To set the deposit interest rates below the competitive equilibrium level, and create "rent opportunities" through the interest rate spread; to regulate entry and sometimes direct competition to preserve "rents;" to restrict asset substitution to preserve "rents"	To control interest rates by holding nominal interest rates well below the rate of inflation; repress exchange rates, or overvalue local currency
Degrees of intervention	Selective intervention	Overall intervention
Conditions for implementation	A stable macroeconomic environment, where inflation rates are low and predictable; no heavy taxation (whether direct or indirect) on the financial sector and, more importantly, real interest rates must be positive (to reduce loss on deposits)	
Policy effects	Foster financial deepening and improve efficiency of credit allocation	Low state of financial development, weak institutions, poor deposit mobilization, and negative returns to financial assets

Source: Zhao and Zhu (2015)

always taken up a high percentage of household financial assets, despite the stock market fluctuations (Table 3).

2.3 Strategy for Financial Stability: “Online Balance Sheet Repair”

Developing economies often experience the impacts of financial risks during their financial development. The reason that China’s financial system has kept expanding and provided support for industrial development is that China, in the face of such impacts, has adopted the strategy of “online balance sheet repair” (Zhou 2013) to maintain the stability of its financial system.

The policy contains two factors. In particular, “repair” refers to the balance sheet repair of financial institutions affected by large-scale financial risks, while “online” means that the repair will not influence the normal economic operation or the capital’s basic function as a medium, or the financing function—that is to say, economic operations cannot be interrupted, as the “machine” should keep running and, meanwhile, components going wrong should be replaced (Zhou 2013).

“Online balance sheet repair” is supported by three major policies. The first is interest spread protection, which is consistent with that of financial restraint. Interest spread protection or management is

vital to repair bank balance sheets and maintain financial functions. As Zhou Xiaochuan (2012), Governor of the People’s Bank of China, stated: “At the beginning of 2000, China’s major banks were going through restructuring, repairing their balance sheets and seeking for more capital, which would possibly have negative influence on their active functioning as capital intermediaries. Moreover, the banks were concerned about their own capital quality. At the time they realized the importance of interest spread management because certain spread could stimulate the banks to liquidate their own assets and grant loans.”

The second policy is the stripping of non-performing assets (NPAs) and capital injection. Under the impact of large-scale financial risks, banks are concerned about their asset quality. In such a context, stripping the NPAs via “online balance sheet repair” can help reduce their concern, as separation is more efficient than increasing liquidity (Zhou 2013). On this basis, China established four major asset management companies in 1999, especially dedicated to disposing of the NPAs separated from the banks. Since 1999, these companies have disposed of more than RMB 2 trillion of the nearly RMB 3 trillion in NPAs separated from China’s banks. After the separation of NPAs, the central government has injected capital into major banks by issuing special treasury bonds, foreign exchange reserves, and other ways, to increase the banks’ capital. In particular, a total of RMB

Table 8.3: Distribution of household financial assets

	2005		2006		2007		2008		2009		2010	
	Sum	%	Sum	%	Sum	%	Sum	%	Sum	%	Sum	%
Financial assets	20.91	100.00	25.16	100.00	33.55	100.00	34.29	100.00	41.09	100.00	49.48	100.00
Local currency inflation	1.99	9.54	2.25	8.93	2.52	7.51	2.86	8.35	3.20	7.78	3.77	7.62
Deposit	15.06	72.01	17.17	68.26	18.18	54.20	22.85	66.64	26.87	65.39	31.56	63.79
Securities	1.44	6.89	2.39	9.52	5.83	17.38	2.51	7.33	5.00	12.17	5.92	11.96
Bonds	0.65	3.13	0.69	2.76	0.67	2.00	0.50	1.45	0.26	0.64	0.27	0.54
Stock	0.79	3.76	1.70	6.76	5.16	15.38	2.02	5.88	4.74	11.53	5.65	11.41
Fund	0.24	1.17	0.56	2.23	2.97	8.86	1.70	4.96	0.84	2.04	0.73	1.48
Securities on deposit	0.16	0.75	0.31	1.24	0.99	2.95	0.48	1.39	0.57	1.39	0.44	0.90
Insurance reserves	1.83	8.76	2.27	9.01	2.71	8.08	3.78	11.03	4.62	11.25	5.27	10.64
Funds for agency wealth management											1.50	3.03
Income from trust plans											0.31	0.62

Source: China Financial Stability Report (2012)

Note: Unit: RMB Trillion

270 billion of special treasury bonds were issued in 1998, and about US\$100 billion have been injected into the Bank of China, China Construction Bank, Industrial and Commercial Bank of China, and Agricultural Bank of China through foreign exchange reserves since 2003.

The third policy promotes the reform of the banking industry. The wholly state-owned commercial banks have carried out such reforms as the introduction of the shareholding system or strategic investors and being listed on stock markets. In 2003, the Central Huijin Investment Co., Ltd. was established and mandated with exercising the rights and obligations as an investor in major state-owned financial enterprises, on behalf of the state, marking the essential progress in introducing the shareholding system in wholly state-owned commercial banks. Later, Bank of China, China Construction Bank, Industrial and Commercial Bank of China, and Agricultural Bank of China were converted to shareholding banks, introduced foreign

commercial banks as strategic investors, and were successfully listed on stock markets. To reform rural credit cooperatives, such measures as the dissolving or merging of some of them and setting up credit cooperative unions have been adopted, which have strengthened the management and control of credit cooperatives.

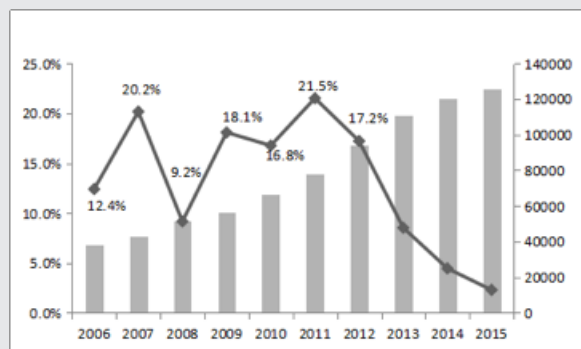
3. COLLATERAL VALUE, FUNDRAISING FROM THE EQUITY FINANCING MARKET, AND INDUSTRIAL DEVELOPMENT

Compared with developing or even developed economies, China has performed well in its industrial development, in at least two aspects. First, in 2010, China became the largest manufacturing country in the world and has maintained that status. In 2015, 56 manufacturing enterprises were listed in the world's top 500 enterprises. In 2016, China led the world's output for about 220 of over 500 major industrial products.



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Figure 8.3: Outstanding loans granted by commercial banks to the manufacturing industry



Source: CBRC (2007–2016)

Note: Columns indicate outstanding loans (RMB 100 million, right axis); grey line indicates growth rate

support the manufacturing industry and how the equity financing market can bolster the Internet industry.

1.1 Collateral Value and Financing in Manufacturing Industry

The banking industry has provided a large number of loans for the manufacturing industry. In 2015, the outstanding loans granted by the commercial banks to the manufacturing industry amounted to RMB 12.8 trillion, and from 2006 to 2012, the average annual growth rate reached 16.4 percent (see Figure 8.3).

Driven by the incentive of interest spread protection and the pressure of competition in the banking sector, China's banks have had the natural impulse to grant loans. However, the banks receive deposits from the public and have low appetites for risk. In addition, at the end of the 20th century and in the beginning of the 21st century, the NPL ratio had reached about 30 percent, and the regulatory department imposed stringent requirements for the security of loans and established a lifelong accountability system for the granting of loans, thereby improving the degree of risk aversion in China's banking industry. So what factors propel the risk-averse banking sector to grant loans to the manufacturing industry? By introducing the shareholding system into commercial banks, together with regulatory measures, the aim was to prevent the government from intervening in banks' micro-operations; thus, the willingness to grant loans is not because banks are forced by the government to do so.

Second, the Internet industry has developed rapidly. In 2016, the on-line retail volume accounted for 12.6 percent of the total volume of retail sales of consumer goods, ranking first among the major economies in online sales; and four Internet enterprises entered the top 10 global Internet companies in terms of market value, exceeded only by US enterprises.

From the financial perspective, there are distinctive differences between manufacturing and Internet industries. Generally, the former falls into the category of heavy-asset industry, with more collateral and greater support from the banking system, while the latter is in the category of light-asset industry, with less collateral but greater support from the equity financing market. In light of these differences, this section largely discusses how the banking system can

In fact, the reason for these loans is that the continuous and rapid increase of collateral value. Under the conditions of information asymmetry, when granting loans, banks rely significantly on collateral. To a large extent, how much collateral an enterprise possesses, or how high its collateral value is, determines its accessibility to loans. In general, land and real estate are quality collateral favored by banks. With the rapid growth of economy, prices of land and houses also

Table 8.4: Prices of residential land in Beijing

	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8	Level 9	Level 10
Early 2002	5,870	4,780	3,660	2,845	2,145	1,440	855	490	275	200
Early 2014	28,720	24,520	20,390	16,330	12,810	10,010	7,300	5,050	3,400	2,200
Increase (percent)	389.3	413.0	457.1	474.0	497.2	595.1	753.8	930.6	1136.4	1000.0
Average annual increase (percent)	12.0	12.5	13.5	13.8	14.3	16.0	18.3	20.4	22.5	21.2

Data source: Beijing Municipal Bureau of Land and Resources

Note: Unit: RMB/square meter

rise fast. Consider Beijing, for example. As announced at the beginning of 2014, the price of Level-1 residential land was RMB 28,720 per square meter, rising by 3.89 times from 2002, with an average annual increase of 12.0 percent, while the price of residential land at other levels saw a much larger increase (see Table 4).

This means that a bank, when deciding whether or not to grant loans, does not need to examine an enterprise's primary source of repayment, nor its future operational prospects or cash flow. Instead, as long as the enterprise possesses sufficient quality collateral, the bank can grant loans to it. The bank can acquire the collateral, such as land or real estate, the value of which can cover the risks of taking losses on loan defaults. In China, the bank is nicknamed "pawnshop," as it is highly dependent on collateral.

China has also adopted policies promoting micro and small enterprises, achieving some results that have been lessons learned. For example, China has established many policy guarantee enterprises, which have played various roles, but it is still predominantly focused on the massive development of private guarantee institutions. Insufficient regulation and lack of sustainable business models have turned private guarantee institutions into either actual financing platforms for their controllers, or for those engaged in illegal operations, often charging very large guarantee fees. Instead of helping micro and small enterprises with financing, these policies have disrupted the financial market order and increased enterprises' burdens. Moreover, the interconnection and mutual guarantee model, which was promoted as an innovative financial method for micro and small enterprises' financing, has incurred considerable guarantee circle and guarantee chain risks in Zhejiang, Jiangsu, Shandong, and other regions during the period of economic slowdown. Because the enterprises did not anticipate the risks, they hastily engaged themselves in interconnection and mutual guarantee modes, subject to payment obligations.

In addition to loans and financing from the banks, China has also introduced stock-based, industrial investment-guided funds to support the manufacturing industry, especially those of strategic

importance. For example, to boost the development of the integrated circuit industry, China set up China Integrated Circuit Industry Investment Fund Co., Ltd., in 2014. At the end of 2015, more than RMB 100 billion had been collected.

1.2 Fundraising from the Equity Financing Market and Internet Industry Development

The rapid development of the Internet industry has largely resulted from the support of the equity financing market. However, it was not so much from the domestic equity financing market, at least not in the early development period. At the beginning of the 1990s, China established the stock market, but for a long period it mainly served state-owned enterprises in their reforms, and the requirements for being listed were quite stringent. Even though the SME (small and medium-sized enterprise) board and the growth enterprise board (GEB) were established later, typical information technology enterprises seldom achieved listing on domestic stock markets. China also set up stock-based, government-guided funds and adopted policies to encourage venture capital (VC) development in the early stages. However, in the beginning years, it was the foreign venture capital that played the major role in the Internet industry.

The development of the Internet industry mainly relied on attracting funds from the overseas equity financing market, specifically, foreign-invested venture capital and fundraising from overseas stock markets. For a long period, foreign investment into the Internet industry was strictly restricted, but enterprises and foreign investors adopted Variable Interest Entity (VIE) structures to avoid these restrictions. Chinese authorities eventually acquiesced.

China's typical Internet enterprises, including Baidu, Alibaba, Tencent, JD.com, and Sina were all listed on overseas stock markets, especially in the United States (see Table 5). There are two reasons for this: (1) the financial and corporate governance structures of some Internet enterprises do not meet the listing requirements of the domestic stock market; and (2) being listed on overseas stock markets, especially in the United States, can help to enhance the companies' popularity. Therefore, many Internet enterprises sought listing on US

Table 8.5: Listing of China's Typical Internet Enterprises

	Baidu	Alibaba	Alibaba	Tencent	JD.com	Sina	NetEase	Sohu
Time of listing	2005	2007	2014	2004	2014	2000	2000	2000
Venue of listing	Nasdaq	HKEX	NYSE	HKEX	Nasdaq	Nasdaq	Nasdaq	Nasdaq

stock markets, which provided high-yield channels for withdrawal of venture capital (VC) and private equity (PE), the wealth effect of which, in turn, has encouraged Internet start-ups and more VC and PE to invest in the Internet industry.

4. INSPIRATIONS FROM CHINA

On the whole, in more than 30 years of industrial development, China has brought its financial system into better order and gained some valuable experience. For example, it used a financial restraint system to promote the development of the financial system. When facing the impact of financial risks, it adopted the “online balance sheet repair” strategy to maintain basic financial stability; in the context of the backward equity financing market, it attracted funds from the overseas equity financing market. Such experience is noteworthy for most African countries which are still financial underdeveloped, with less financial deepening, banking systems vulnerable to risks, and immature equity financing markets.

However, China’s financing mode is also exposing more and more problems. First, the financial sector is oversized, enterprises suffer from excessive debt, the remuneration structures of the industries are severely unbalanced, and the excessive prosperity of the financial industry causes the capital, talents, and entrepreneurs to “move from the real economy to the fictitious economy,” indicating more and more the obvious negative externalities in the industrial development of real economy.

Second, the credit mode excessively relies on such collateral as land and real estate, as well as the increase of their values, which reduces the commercial banks’ risk-control technology and ability; this is not conducive to improving their innovative ability and competitiveness. Third, for the financing of micro and small enterprises, priority shall be given to developing policy guarantee institutions instead of private guarantee companies, and the interconnection and mutual guarantee mode subject to debt-repaying obligations shall be discreetly handled. Finally, it still remains a subject for study on how domestic equity financing marketing can attract and retain outstanding, listed Internet enterprises.

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Kalagadi Manganese Mine. First Manganese Mine owned by a black woman in South Africa © 2017. African Development Bank Group



CHAPTER 9

FINANCING
INDUSTRIAL
DEVELOPMENT
IN KOREA AND
IMPLICATIONS FOR
AFRICA

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1. INTRODUCTION

South Korea (officially, the Republic of Korea) has achieved rapid economic growth for several decades, since the early 1960s. In 1996, South Korea finally joined OECD and the ranks of high-income economies. Its economic growth is noteworthy, because its initial conditions were quite similar to many African countries, in that South Korea underwent several decades of colonial rule, several years of civil war, and a period of hunger and food shortage in the 1950s, and reliance on US food aid. It was worse in terms of resource endowments, with all the minerals located in North Korea. Furthermore, although it launched a series of 5-year economic plans, beginning in the early 1960s with the new political leadership (ex-military, President Park), Korea was once in the same situation as other developing countries, in terms of facing the continual external imbalances with persistent trade deficits, until the late 1980s (Lee and Mathews 2010; Lee 2016, Ch. 1).

While the initial emphasis of the industrial policy was promotion of labor-intensive sectors for earning dollars by exporting in the 1960s and 1970s, the government put a new emphasis on technological development, mostly since the 1980s, with some preparation in the 1970s. The preparation for such a policy shift was started with establishment of government research institutes (e.g., Korea Institute of Science and Technology [KIST]) in the 1970s to conduct problem-solving R&D for private firms and to transfer the R&D outcomes to them. Beginning in the mid-1980s, a decisive policy shift occurred, when the government encouraged private, in-house R&D by allowing tax exemptions for R&D expenses, and even initiating public-private joint R&D to break into higher-end segments and sectors involving bigger and riskier projects (Lee 2013c; Lee and Kim 2009). This policy initiative succeeded in building the competitive and high-end manufacturing sector, which was an important factor that led to a trade surplus in 1986, for the first time in the modern Korean history.

Since then, Korea has been able to overcome the persistent trap of external imbalances or stop-go cycles of crisis and reforms.

It was Amsden (1989) that attributed such successful economic catch-up to industrial policy by the government, getting prices wrong and creating rents for targeted sectors. Industrial policy in Korea, under the leadership of the Economic Planning Board (EPB), has more or less followed the practices of Japan, which is well documented in the influential work of Johnson (1982), who attributed the Japanese miracle to the role of one super ministry called MITI (Ministry of International Trade and Investment) in Japan. One of the first definitions of industrial policy was in Johnson (1982), who defined it as policies that aims to improve the structure of a domestic industry in order to enhance a country's international competitiveness.

While Japan and Korea have made remarkable success in catch-up development, owing to industrial policy, some other countries followed the free market principle of the so-called Washington Consensus and focused on macroeconomic stabilization and trade and financial liberalization. While the latter group also experienced some economic growth, it tended to be short-lived or of the stop-go cycle type, because those following the Washington Consensus principles failed to bring up capabilities of private sectors (Lee and Mathews 2010). While Rodrik (1996) noted the importance of sequential or gradual adoption of 10 policies of the Washington Consensus in East Asia, different from the simultaneous adoption in Latin America, he missed the fact that East Asia had further built up and upgraded capabilities, since the mid-1980s, before moving to more marketization (the next five policies in the Washington Consensus) (Lee and Mathews 2010).

When we see catch-up growth as the process of capacity building, what we have in mind is the capacity of private corporations. The

capacity of latecomer economies to grow capable private companies is the most important and fundamental criterion to determine the success or failure of economic development or growth. The corporations may initially be state-owned firms (e.g., the Pohang Iron and Steel Company [POSCO] in Korea), when the risks for private capital are too high. The idea, however, is to move them towards private ownership (i.e., make them “public” through an initial public offering [IPO]) eventually, after they build up certain levels of capabilities or competitiveness. Thus, this paper considers the essence of industrial policy to be building the capabilities of private firms to sustain long-term economic growth, rather than picking winners or providing protection for some firms or sectors (Lee 2013b).

Among various aspects of capacities, emphasis should be on technological capabilities, because without these, sustained growth going beyond the middle-income trap is impossible (Lee 2013c). In this era of open market competition, private companies cannot sustain growth if they continue to rely upon cheap products; they need to be able to move up the value-chain to higher-value added goods, based on continued upgrading and improvement and technological innovation. Furthermore, another important feature of the Korean model is that these private companies have been “locally owned” companies, including locally controlled joint ventures (JVs), not foreign controlled subsidiaries of the multinational corporations (MNCs). MNCs are always shopping around the world, seeking cheaper wages and bigger markets. Therefore, they cannot be relied upon to generate sustained growth in specific localities or countries, although they can serve as useful channels for knowledge transfer and learning.

In what follows, we discuss the role of the government or industrial policy in this process of capability building, with focus on the financing aspect of the policy implementations. This paper can be regarded as sequel to Lee (2013a) and Lee (2015). The former has a more theoretical focus, discussing the three types of failures—market, system, and capability—failures as a justification for government activism, whereas the latter discusses the different tools of industrial policy at different stages of development.

In Section 2, we first elaborate the nature of financial control by the government, which has been one of the enabling conditions for industrial policy since the 1960s (its take-off). We also explain the roles and evolution of key developmental banks, such as the Korea Development Bank, Ex-Im Bank, and Industrial Bank for small and medium enterprises (SMEs). Section 3 elaborates the three episodes of industrial policy and financial arrangement in these cases, such as the case of establishment of POSCO, targeted development of

bottleneck technologies for SMEs, and leapfrogging into digital TV since the mid-1990s. Then, Section 4 concludes the paper with a discussion of the implications for African economies.

2. THE FINANCIAL SYSTEMS AND INDUSTRIAL POLICY IN KOREA

2.1 Financial Control and Industrial Policy

The serious scarcity of capital in the 1960s and 1970s in Korea forced firms to depend heavily on credit for raising finance beyond retained earnings. In the absence of effective capital markets, the state used its control over the banking system to channel domestic and foreign savings to selected industries or firms (Lee and Lee 2016; Ch. 2). The new regime that took power in 1961 nationalized the commercial banks, and thus, the banks were owned by the government until the 1980, when they were privatized. Although many banks have been privatized, the Korean government still maintains effective control over the banking institutions through its personnel policies. In Korea, the government exercised almost direct control over private sectors through their control of credits.

For an effective state activism or industrial policy, state ability for financial control was critical. One often does not notice the critical difference between the state’s financial control through credit allocation and other control instruments, such as tariffs, import quotas, tax incentives, and entry or trade licenses. First, financial control implied more discretionary control. With credit allocation, the state can control not only the financial ability of firms, but can also impose the firm’s compliance in other matters. Second, a qualitative difference was that the state’s financial control was not based on its political authority, which was the case for other instruments that are supported by legislation or regulations; rather the state’s financial control was based on state’s economic power, which was associated with its ownership of banks. Third, whereas most other controls, except licensing, were aimed at specific industries or sectors, and thus, affect firms only indirectly, financial control was directly aimed at individual firms.

In this regard, a simple but fundamental fact should be noted: the state’s financial leverage over firms carried the power of control because firms had a strong motivation to better their performances and because firms believed credit supply to be critical. In Korea, the firms’ motivation for success derived from private ownership and the expectation that the firms would be the beneficiaries of their good performance. Thus, even if big business firms were under so-called soft budget constraints due to their special connections with state agencies, that did not necessarily lead to weak motivational



Young man riding bicycle with a big linking of bananas to sell. 2013. Kisoro. Uganda. © 2017. Shutterstock images

efficiency, as it did in socialist firms, but can, in fact, led to exactly the opposite behavior, i.e., excessive risk taking.¹

Korea had a huge saving gap in the 1960s, with domestic savings at 9 percent of GDP and gross investment 15 percent of GDP, and thus, had to rely on foreign borrowing to fill the gap. That is why exports were so important and the critical binding constraint for growth for an economy at lower and middle-income stages. Despite the low income and thus low domestic saving, Korea had maintained a higher investment rate, and one of the reasons for this was the low-interest rates, suppressed by the government. So, Korea was basically under a condition of financial repression, but it may be considered as “financial restraints,” in the terms of Hellmand, Murdock, and Stiglitz (1997), in that the real interest rates had been at least positive. Despite this suppressed interest ratio, domestic savings ratio in Korea had continued to increase, owing to the growth of income associated with strong investment over the decades (Cho 1997); the domestic savings rates had increased from 9 percent in the early 1960s to about 30 percent in the mid-1980s.

In the Korean experience, the banking sector had always been supposed to “serve” the real sectors by providing a stable supply of the so-called “growth money” at affordable rates, whereas the manufacturing or production sectors had always been given priority. Of course, such practice had been possible because Korea established several development banks, such as Korea Development Bank, Ex-Im Bank, and Industrial Bank and also, because most of the commercial banks were under government ownership or control until they were privatized in the mid-1980s. With very a small margin between the lending and deposit interest rates, profitability of banking sectors was very low, which boosted the profitability of the manufacturing sector, so that private investment flowed into manufacturing rather than into financial businesses.

Furthermore, manufacturing sectors were often earning rents, owing to entry control by the government in adjusting the “optimal number” of firms in each sector, in consideration of the market size, so that the admitted firms were, in effect, guaranteed minimum levels of profits (rents), which can be a source of investment funds for next period. Making the rate of return in certain industrial sectors

¹ Park (1990) mentioned risk taking in the form of excessive and duplicative investment in the heavy industry drive in Korea in the late 1970s.

higher than interest rates can be another means to direct industrial policy, especially in a situation facing high interest rates.

In Korea, this tradition of implementing entry control in many sectors had been regarded as a type of industrial policy modeled on Japanese practices (Johnson 1982). The practice had two meanings. The first was to sort out the “good” and “bad” producers, and the second was to allow stable profits for the selected producers, so that they were assured long-term profits, that they may be encouraged to invest more in fixed capital for business expansion. This practice also had the effects of having the return rates higher than interest rates, which was also good for boosting private investment. Simply put, the idea was that, for instance, five firms with profits in a sector are better than 10 firms with no profits. Such practice of entry control had been one of the typically used tools of industrial policy in the past in Japan and copied in Korea.

2.2 The Roles and Evolution of Several Developmental Banks

Korea Development Bank (KDB)

The Korea Development Bank (KDB) has been the main vehicle for policy loans, or the so-called development financing in Korea, with its value of assets of 269.7 trillion won (232.5 billion USD) in 2016. The bank was established at 1954. The main function of Korea Development Bank was to provide funds for industry, especially for manufacturing, agriculture, and mining. In the 1950s, the bank’s main source of funds was foreign aid from United States, and using these funds, KDB invested in basic industries such as the fertilizer and cement industries and recovery of the power plant destroyed by the Korean War (Korean Economy Compilation Committee 2010). Private firms needed endorsements from the finance minister to obtain KDB loans when the source of funds was not aid money. Thus, the overall size of policy loans from KDB was relatively small. Until 1960, their policy loans were less than 16 billion won (250 million USD).

In 1961, the new government changed development strategy from import–substitution industrialization to export-led industrialization. To do that, they made supplying of the policy loans the main “duty” of the financial sector, with KDB as the pillar bank in this regard. Laws concerning the KDB were revised four times in the 1960s, and the bank’s registered capital increased from 40 million won (0.32 million USD) in 1961 to 150 billion won (520 million USD) in 1969, with the legal right to borrow money from foreign countries (KDB 2014). Using these funds, policy loans from KDB increased by about 12 times from 20.3 billion won (162.7 million USD) in 1961 to 239.13

billion won (608.6 million USD) in 1972 (Son 2013). Most of loans were used for production facilities, and 55.9 percent of the funds, out of the total loans made in Korea for production facilities, were provided by KDB (KDB 2014). KDB also provides guarantees for loans when Korean firms borrow from foreign financial institutions. The amount of the guarantees increased from 18.1 billion won (139.2 million USD) in 1963 to 600.3 billion won (1.73 billion USD) in 1971 (KDB 2014).

The Korean government started fostering heavy and chemical industry in 1973. These industries have characteristics, which require a large amount of investment and a long time horizon to be profitable. To supply such investment funds for heavy and chemical industrialization, KDB acquired loans from foreign financial institutions, such as the Asian Development Bank (ADB) and the International Bank for Reconstruction and Development (IBRD), and issued foreign currency bonds in the international capital market. Funds from foreign financial institutions and foreign currency bonds increased rapidly from 4.79 billion won (12.2 million USD) in 1972 to 478.7 billion won (989 million USD) in 1979 (KDB 2014). As a result, about half of KDB funds came from foreign countries in 1979. Remaining funds of KDB mainly come from the “National Investment Fund,” which was raised by issuing bonds sold to households and private banks. The government forced every commercial bank to buy the bonds of the National Investment Fund, using as much as 20 percent of the annual increase in their savings deposits (Nam 2009). Using these funds, policy loans from KDB increased very rapidly, by about 10 times from 318.47 billion won (799.5 million USD) in 1973 to 3.12 trillion won (6.4 billion USD) in 1980. These funds were used mainly for heavy and chemical industries, such as shipbuilding, steel, machinery, chemical, automobile, and electronics industries.

In the 1980s, the focus of industrial policy changed from sector selective industrial policy to bottleneck technology development (Shin and Lee 2012). In accordance with the change, since 1981, law concerning KDB has specified that KDB could provide funds for R&D in the emerging industries. Also established, in 1984, was the “Korean Technology Financing Corporation,” to match increasing venture capital demand. Due to these changes, the rate of increase of KDB policy loans slowed down in the 1980s, which increased from 3.12 trillion won (6.4 billion USD) in 1980 to 10.59 trillion won (15.8 billion USD) in 1989. In terms of source of funds, the share of loans from foreign countries and foreign currency bonds decreased as the Korean economy grew. Instead, the share of domestic bonds and deposits increased from 13.2 percent in 1980 to 80.4 percent in 1989 (KDB 2014).

Export-Import Bank of Korea

The Export-Import Bank of Korea was established in 1976, to provide long-term policy finance to exporting firms, active in the export of capital goods. Given that the capital goods sectors were one of the least developed sectors (Lee and Kim 2016), strong export financing was needed to offset some of the competitiveness disadvantages facing the Korean firms. The new strategy of the Korean government, since the mid-1970s, to promote heavy and chemical industrialization also targeted exports of capital goods. To do that, long-term export financing was needed at that time, because international markets for capital goods were basically buyers' markets, and many foreign buyers required deferred payment conditions to sellers. Furthermore, it usually takes a long time to make capital goods, so it is very difficult for firms in latecomer countries to export without long-term financial support, if foreign buyers demand deferred payment conditions (Export-Import Bank of Korea 1996).

To support domestic exporting firms facing the deferred payment condition from the foreign buyers, the Export-Import Bank of Korea provided long-term policy loans, with repayment periods as long as 10 years. Annual interest rate was 7 percent, which was relatively very low level. After the establishment of the Export-Import Bank of Korea, the amount of export financing increased from 134.2 billion won (277 million USD) in 1977 to 444.3 billion won (918 million USD) in 1979, and to 774.7 billion won (890 million USD) in 1985. Share of exports, supported by loans from the Export-Import Bank of Korea, among total exports also increased from 1.5 percent in 1977 to 4.8 percent in 1984 (Export-Import Bank of Korea 1996). From 1976 to 1985, 76.5 percent of their export financing went to the shipbuilding industry. It supported rapid export growth in the shipbuilding industry for which the annual average export growth rate was 20.5 percent during this period. Remaining funds went to other heavy and chemical industries. In the late 1980s, exports of shipbuilding and plants decreased due to change of international conditions, so that the amount of export financing decreased to 314.4 billion won (356 million USD) in 1986. In response to this decrease, the Export-Import Bank of Korea expanded the list of target industries to include electronics and electrical instruments.

From the late 1980s, the Korean economy posted a trade surplus for the first time, and thus, some of the government regulations against outbound foreign investment by domestic firms were relaxed. In accordance with the easing of the regulations, the Export-Import Bank of Korea provided policy loans to Korean firms that invested in foreign countries. Facing rising wage rates in Korea, firms in the light industries, such as textile industries, tried to move their production

facilities to developing countries, which had cheaper labor costs. Thus, the Export-Import Bank of Korea provided them with financial services. As a result, loans for international investment increased from 5.17 million dollars in 1987 to 574 million dollars in 1995 (Export-Import Bank of Korea 1996).

Industrial Bank of Korea (IBK) for the SMEs

The Industrial Bank of Korea (IBK) was established by the Korean government in 1961. Its main function was to provide loans for SMEs. The law on the IBK specified that the share of the SMEs in its total loans should be at least 90 percent (IBK 2011). In addition to firms in manufacturing, mining, and transportation, since 1973, firms in the construction, commerce, and service sectors could also be regarded as the client SMEs for IBK. Nevertheless, the main focus was manufacturing SMEs with respect to IBK's contribution to export-led industrialization strategy. One difference between IBK and either KDB or the Export-Import Bank of Korea was that the majority of IBK's funds came from deposits by households and firms, and the share from international borrowings or from the National Investment Fund was small. However, compared to KDB and the Export-Import Bank of Korea, the sizes of their policy loans were relatively small. The amount of a policy loan from IBK was about one-third of that from KDB in the 1960s and 1970s.

To support export-led industrialization, IBK increased their policy loans very rapidly from 2.1 billion won (16.8 million USD) in 1961, to 52.7 billion won (170 million USD) in 1970, and to 645 billion won (1.3 billion USD) in 1979 (Son 2013). Share of SME loans from IBK, among the total amount of SME loans was 21.7 percent in 1970. IBK also provided SMEs with consulting service or technology guidance (with the UN Development Programme [UNDP]) to improve the competitiveness of SMEs.

In the early take-off period in Korea, the main focus of development strategy was on a selected number of big businesses, which were the leading exporters during the period. Especially, heavy and chemical industrialization, from the mid-1970s, targeted big businesses that could meet the requirement of a certain size of fixed capital investment. In this policy background, the SMEs weren't the main focus of industrial policy. However, the new regime, which took power in 1980 after the death of the President Park, introduced some changes in industrial policy, such as the shift from sector-specific targeting to technology-specific targets. Another change, since the mid-1980s, was to allocate more resources for SMEs in technology-intensive businesses. Since 1981, IBK has provided policy loans for SMEs that make various intermediate goods,

such as diverse parts, industrial materials, and tools, and sell to big firms. Since 1986, IBK has provided long-term policy loans to these SMEs. In 1989, IBK began providing policy loans for small firms whose potential for future growth was good but their number of employees was less than 50. These small firms usually had difficulty in getting loans from commercial banks, which required some value of collateral. Thus, IBK provided policy loans to these firms without requiring much collateral. Due to these kinds of financial support, policy loans from IBK increased from 970.5 billion won (1.6 billion USD) in 1980 to 6.69 trillion won (9.45 billion USD) in 1990.

3. STORIES OF INDUSTRIAL POLICY AND FINANCING

3.1 Industrial Policy to Develop a Strategic Sector: The Case of Pohang Steel²

Growth and development of the steel industry in Korea has been represented by a state-owned company, POSCO. Typically, state activism is justified when there is a certain degree of positive

externalities, such as that of market failure prevailing in terms of the gap between private and social returns. POSCO's case fits into this category for state intervention. Steel is an input in diverse sectors of production. Given the high degree of the scale economy and a limited size of the domestic market, throughout the history of Korea, steel goods were certain to be underproduced if left with private firms, and private monopoly would charge much higher prices. Reliance on imported steel alone would lead to no benefits from backward and forward linkages. Under these conditions, entry by establishing a state-owned enterprise (SOE) seemed to be the rational choice in the context of the past Korean economy.

During the reconstruction period after the Korean War (1950–1953), the rising domestic demand for steel products led to the need for the construction of an integrated steelworks.³ At the time, most Korean steelmakers used scrap iron, rather than pig iron, as raw material. With scrap metal running out, the need for a stable supply of pig iron increased. In addition, Korean steel firms in those days were small and specialized in only one segment of the whole process of

² This sub-section relies on Lee (2015)

³ This paragraph is based on Lee (2015).

Table 9.1: Financing for the Pohang project (US\$ million)⁴⁶

Phase	Period	Govt. capital ^a	Domestic funds ^a	Own funds ^a	Foreign capital ^a	Total costs ^a
I	1970–1973	111	26	0	197	334
		(33.2)	(7.7)	(0.0)	(59.1)	(100.0)
II	1973–1976	19	39	157	376	591
		(3.2)	(6.5)	(26.6)	(63.6)	(100.0)
III	1976–1978	225	101	293	768	1,387
		(16.2)	(7.3)	(21.1)	(55.4)	(100.0)
IV-1	1979–1981	121	336	327	768	1,552
		(7.8)	(21.7)	(21.1)	(49.5)	(100.0)
IV-2	1981–1983	0	47	189	118	354
		(0.0)	(13.3)	(53.4)	(33.3)	(100.0)
Total		476	549	966	2,227	4,218
		(11.3)	(13.0)	(22.9)	(52.8)	(100.0)

Source: Song (2002, 118)

Note: ^a Percent of total costs in parentheses

steel production. This inefficient separation underlined the advantage of having an integrated steel mill.

In the absence of private capitalists able to take on a heavily capital-intensive, integrated steel project, government initiative was inevitable. However, the Korean government's six attempts for 11 years between 1958 and 1968 all foundered. The main reason for the failure lay in financing the projects. Opposing the Korean government's plan to build an integrated steel mill, the World Bank and the US Agency for International Development (USAID) expressed concerns about Korea's ability to repay foreign loans and questioned the need for a large-capacity steel mill in a small developing economy (D'Costa 1999, 64; Song 2002, 57). Rather, the World Bank and USAID suggested first developing steel-consuming industries, such as machinery, automobile, and shipbuilding (Song 2002, 57). The Korean government rejected their opinion and insisted that steel-consuming industries were not a prerequisite for the successful development of the steel industry, and that the steel industry should grow first for the effective development of steel-consuming sectors. Former President Park Chung-hee took the initiative and gave top priority to the steel project in the second five-year economic development plan (1967–1971). The steel project was one of the three key projects of the plan. The others were the Ulsan petrochemical complex and the Gyungbu Expressway (Song 2002, 42–43).

The Korean government created the state-owned steel firm POSCO in 1968. The government held 56.2 percent of the company's shares, and the remaining 43.8 percent was held by the state-run Korea Tungsten Co. Two years later, the company commenced construction of the initial phase of the nation's first integrated steelworks in Pohang. The long-lasting principal problem of financing was overcome by "ingenious" methods (D'Costa 1999, 63–64). Through agreements with the Japanese government in 1969, the Korean government allocated part of the war reparation funds from the Japanese to the Pohang project. A total of \$73.7 million from the war reparation funds for three years was assigned to the first phase. Another loan worth \$50 million was provided by Japan's Export-Import Bank. Japanese sources accounted for approximately 60 percent of the capital needs of the first phase (Song 2002, 76). The rest was covered by local capital.

Table 1 presents the sources of financing by phase. Direct investment from the government accounted for 11.3 percent of the project's total costs. The government's intervention and assistance

enabled POSCO to access domestic and foreign sources, accounting for approximately 66 percent. Domestic sources were state-run and private bank loans with very low interest rates, actually negative in reality. To mobilize resources from abroad, the government negotiated with foreign lenders on behalf of its national producer and guaranteed POSCO's loan payments. Evident from Table 4 is the increasing share of POSCO's own funds from 0 percent (Phase I) to 53.4 percent (Phase IV-2), whereas that from foreign capital declined from 59.1 percent to 33.3 percent over the same period. These changes indicate that POSCO's ability to generate internal funds was gradually enhanced while the government nurtured the industry through various instruments, which is addressed in the next subsection.

In 1970, the steel mill's first-stage construction commenced in Pohang. By 1983, its production capacity had expanded four times. Additional integrated steelworks were constructed in Gwangyang in the mid-1980s. As a result, the Korean steel production increased sharply. By 1993, the only Korean integrated steel firm broke the 30 million tonne mark, which placed Korea in sixth place in the global crude steel production. During the period of 1973 to 1993, the compound annual growth rate (CAGR) of the Korean crude steel output was 21.2 percent, whereas that of the world was 0.7 percent. In 1998 and 1999, POSCO became the world's biggest steel producer, surpassing the former top producer Nippon Steel (Lee and Ki 2017). Currently, POSCO has two integrated steelworks in Pohang and Gwangyang, and it produces approximately two-thirds of Korea's total steel output.

Notably, this successful development was made possible by the combination of government activism and the SOE's aggressive technological learning and capability building. In its early stage, POSCO simply purchased and used stabilized or standard technologies and facilities. At the time, overseas training was the primary source of learning. In the 1980s, as POSCO increasingly threatened rival companies in the global export market, access to a foreign knowledge base became more difficult than before. Thus, POSCO established its own R&D system, which was composed of three parities: industry (POSCO), university (Pohang University of Science and Technology [POSTECH]), and institute (Research Institute of Science and Technology [RIST]). The in-house R&D system facilitated the company's stage-skipping catch-up, as it adopted the most up-to-date technologies and facilities in the second steel mill project. The building of POSCO's technological capabilities can be considered a path-following catch-up at the initial stage and a stage-skipping catch-up at

4 Original units are in Korean won. The won-dollar exchange rates used in the conversion are calculated by averaging the daily exchange rates for each phase: 361.00, 448.89, 484.00, 555.36, and 729.31 won/dollar for phases I, II, III, IV-1, and IV-2, respectively.



Young African schoolgirls in playground © 2017. Shutterstock images

the later stage, according to the classification of the three types of catch-up proposed by Lee and Lim (2001).

As a matured industry, technological uncertainty was low in steel production. Furthermore, the Koreans' entry and expansion at a later stage took advantage of the window of opportunity associated with the lowered price of factory equipment and facilities during global recessions, namely, the first and second oil shocks (Lee and Ki 2017). Market uncertainty decreased through government and private efforts to develop automobiles, shipbuilding, and other steel-consuming industries. Finally, after its stable establishment in terms of international competitiveness, this SOE was completely privatized in 2000.

The Steel Industry Promotion Law was announced on January 1, 1970, three months before construction of the first phase of the Pohang plant. The law, which was valid for 10 years, empowered the government to grant POSCO various financial and administrative support for (1) access to long-term and low-cost foreign capital; (2) purchase of equipment and raw materials; (3) construction of port

facilities, water and electricity systems, roads, and railroads; (4) research and technical training; (5) reduced prices on electricity, gas, and water; and (6) discounts for rail transport and port dues (D'Costa 1999, 65; Lee and Ki 2017). At the same time, the law made changes in the Regulation Law on Tax Reduction and Exemption and in the Tariff Law. POSCO was exempted from corporate tax and received an 80 percent tariff cut on the import of equipment (Nam, 1979, 78).⁵ After an extension of another 20 years, the Steel Industry Promotion Law was discontinued in 1986 (D'Costa 1999, 65).

Construction of the first phase for production capacity of 1.03 million tonnes was completed between 1970 and 1973. By 1983, four expansions had been carried out, increasing the total capacity of the Pohang Mill to 9.6 million tonnes (D'Costa 1999, 65). Empowered by the law, the government was able to provide a large fund for the Pohang project in various forms. The government pumped \$476 million into the project. Additionally, in the form of infrastructure support, tax and tariff cuts, and discounts for public utility charges, the government invested approximately \$840 million (Song 2002, 118–19).

⁵ Steel firms with an integrated mill with more than 100 thousand tonnes annual capacity were eligible for this tariff cut.

Table 9.2: Industrial Base Technology Development Projects (IBTDPs), 1987–1995

Unit: 100 mil. won	1987–1990	91	1992	1993	1994	1995	Total
No. of projects	945	551	480	420	422	464	3,282
(new)	617	333	179	258	173	243	1,803
(continuing)	328	218	301	162	249	221	1,479
Investment amount	2,152	1,369	1,395	1,706	2,644	3,701	12,967
(government budget)	1,026	712	727	887	1,414	1,908	6,674
(private sector funds)	1,126	657	668	819	1,230	1,793	6,293

Source: Korea Industrial Technology Evaluation Institute (2007, 45, Table 3–8).

Table 9.3: Outcomes of the Survey to Identify the “Needed” Industrial Technologies

		1986	1987	1988	1989	1990	1991
Number of technological areas (number of the units in charge of the survey)		219 (-)	185 (-)	225 7	102 (9)	200 (-)	200 (27)
Number of experts involved the surveys		818	981	852	492	1,205	1,416
Number of the participating firms		585	733	724	535	1,107	5,994
Budget for the surveys (million won)		205	247	241	240	251	701
A Total number of technologies identified for projects	No. of technologies identified as needed to be developed	581	562	564	417	638	947
	No. of technologies identified as needing further guidance and assistance	118	168	117	56	105	217
	No. of technologies identified to be imported	837	202	202	46	75	165
	Total	1,536	932	883	519	818	1,329

Source: Korea Industrial Technology Evaluation Institute (2007, 12, Table II-3).

When passed, the Steel Industry Promotion Law was criticized as being beneficial solely to POSCO. To be eligible for the previously mentioned government support: (1) a steel firm should have an integrated steel mill with more than one million tonnes annual capacity; and (2) the government should hold over 50 percent stake in that company. POSCO was the only firm to meet those criteria. As a way to establish the steel industry, Park’s administration concentrated all available resources on the single, state-owned POSCO and its integrated steel mill rather than creating the environment for private firms to grow in a market mechanism and with free competition.

The absence of a capitalist class for a capital-intensive steel project enables us to argue that such direct intervention was inevitable and justifiable at the time.

Since 1973, POSCO received a further boost through a substantial change in the economic growth policy of the Park administration. The Heavy and Chemical Industrialization (HCI) Program (1973–1979), designed to shift the Korean economy away from the low value-added light industry, selected six heavy and chemical industries for intensive nurture: steel, petrochemicals, automobiles, machine

Table 9.4: Implementation Plan of the Technology Development Projects Identified by the Demand Surveys

Classification	Characteristics of the technologies	Support plan
Group one	<ul style="list-style-type: none"> Technologies badly needed in the production sites of the firms Basic (generic) technologies identified as common bottlenecks Technologies with high commercialization Possibilities and ones that are soon expected to be developed by existing firms 	<ul style="list-style-type: none"> To be funded by this IBTDPs and/or other policy loans
Group two	<ul style="list-style-type: none"> Long-term, large-scale projects Technologies that require more and broader, basic researches to be successfully developed 	<ul style="list-style-type: none"> To be funded by the Targeted (focused) R&D Projects administered by the MOST
Group three	<ul style="list-style-type: none"> Technologies easily developed with direct grant to the involved firms 	<ul style="list-style-type: none"> To be provided loans for the required expenses for R&D: Long-term, low-interest rate loans (Industrial Development Funds) General policy loans (recommending loans from technology development funds by the Korea Development Bank or Industrial Bank of Korea)

Source: Korea Industrial Technology Evaluation Institute (2007, 12, Table II-4).

tools, shipbuilding, and electronics (D’Costa 1999, 65). This program accelerated POSCO’s growth in two ways. First, the government strengthened its support for the steel industry, mainly through low-interest financing and tax cuts. Second, and more importantly, the HCI drive made the government realize the necessity for the expansion of the Pohang plant and, furthermore, the construction of an additional integrated steel plant. The selected sectors from the program were mostly steel intensive; thus, a significant increase in steel demand was expected from these industries. As a result, following the announcement of the HCI strategy, the Pohang plant was expanded four times from 1973 to 1983. Construction of the second steel plant began in 1985 against the backdrop of the thriving heavy industry (Song 2002, 99, 159–60).

3.2 Industrial Policy to Develop Bottleneck Technologies for the SMEs

The Industrial Base Technology Development Projects (IBTDPs) for the period of the 1987–1991 (which was later renamed as “Industrial Technology Development Projects”) symbolizes the shift to a functional, promotion-type industrial policy from the earlier style of sector-promotion industrial policy (Korea Industrial Technology Evaluation Institute 2007). This shift was initiated by the abolishment in July 1986 of the Industry Promotion Law, which targeted seven sectors, and by the recognition of a new law called the Industrial Development Law in the same year. This new law established the legal

basis for the implementation of the firm survey on their demand for specific industrial technologies, and for implementing various projects to develop “industrial base technologies” (see Table 2 below). The IBTDPs were intended and implemented to develop the so-called bottleneck technologies that can be commonly applicable to a large number of the SMEs, preferably in the form of the tripartite joint R&D by the private–academic–public labs. Also, the ministry in charge changed from the Ministry of Science and Technology to Ministry of Trade and Industry for this IBTDP. As can be seen in Table 2, about half of the funding was from the government budget in each project.

One of the noteworthy features of the IBTDPs was trying a bottom-up approach, compared to the previous top-down approach, to identify key bottleneck technologies by conducting large-scale surveys to firms (see Tables 3 and 4). From 1987 to 1991, five rounds of surveys were conducted, with the spent budget of 1,885 million won, which led to identification of 1,329 needed technologies. Out of these, 934 technologies were funded for development, with a success rate of 84.4 percent.

In this scheme (Table 3), the technologies were classified into several categories, such as those to be funded by these projects and to be developed domestically, and those that could be imported rather than developed domestically. Table 4 shows the diverse financing options for the different identified technologies. Only those

classified in Group I (for instance, those identified as badly needed technologies in many production sites or regarded as common bottleneck technologies) were intended to be funded by this IBTDP. In comparison, those in Group III, such as technologies easily developed with direct grants to the involved firms, are to be developed by direct grants to the specific firms from banks such as KDP or IBK.

3.3 Industrial Policy for Leapfrogging: Digital TV by Public-Private Joint R&D⁶

Along the tradition of Neo-Schumpeterian economics, there has been proposed a thesis of leapfrogging by Perez and Soete (1988). This idea of leapfrogging emphasizes the importance of utilizing emerging technological opportunities in the process of catching up. Perez and Soete (1988) focused on how a catching-up country, not being bound by costly investment in capital goods and infrastructure of the old paradigm, can leapfrog into a new technological paradigm ahead of the advanced countries. Seen from this view, the emergence of digital technology, since the 1990s, was also an opportunity for the latecomers to try leapfrogging.

Actually, in the mid 1990s, Korean companies emerged as the world leader in several innovative digital products (Lee et al 2005). Korea was the first country in the world to develop the CDMA-based (Code Division Multiple Access) digital mobile telecommunication. Also, it was via an LG product that the UK enjoyed its first digitally broadcast TV programs, and via Samsung products that Americans watched the historic launch of the space shuttle Discovery. Samsung and LG command numerous world firsts in terms of technologies and licenses in related fields of digital technology. Since the late 1990s, Samsung and LG have enjoyed the top market shares in digital TVs, both in the UK and in the US. Now, the absolute majority of the TV exports by Korea is of digital TVs, which have replaced analogue TV. This signifies the shift from analogue to digital goods, as the main export item in Korea. Here, let me provide a story of emergence and growth of the digital TV industry in Korea and, thereby, examine the role of industrial policy in this episode of leapfrogging into digital TV by the Korean firms. The period of analysis is from the early 1990s to 2002–2003, and here I rely heavily on Lee, Lim, and Song (2005), which is a detailed case study.

⁶ This sub-section relies on Lee et al (2005).



Togo. 2012. Lome Container Port © 2017. African Development Bank Group

Initial actions toward high definition television, HDTV, by the Korean government and firms were heavily influenced by the Japanese lead in analogue HDTV. The Japanese research group came to Korea during the 1988 Seoul Olympic games and staged a promotional tour of their achievements in the hope that the Koreans would follow their way, as in the past. Recognizing that HDTV would be a next-generation, hot consumer item with immense technological and market potentials, the Korean government first established the Committee for Co-Development of HDTV in 1989. This committee had a participation of three ministries (Ministry of Commerce, Industry and Energy; Ministry of Information and Communication; and Ministry of Science and Technology) and 17 institutions comprising private firms, government research institutes (GRIs), and universities.

The Korean government wanted to promote HDTV as one of the most important export items for the next generation, for the 21st century. The government initiated a grand research consortium for HDTV. It was led by the Video Industrial R&D Association of Korea, the Korea Electronics Technology Institute (KETI), and the Korea Institute of Industrial Technology (KITECH), joined by Samsung, LG, Hyundai, Daewoo Electronics, and other private firms. The Video Industrial R&D Association of Korea took the role of supervising the progress of all the research projects. It evaluated technical aspects of the projects, coordinated opinions among firms involved in the R&D consortium, and collected research proposals and details on the progress of each of the research projects from the firms. Administrative work for the whole research project was carried out initially by Korea Institute of Industrial Technology (KITECH) and later, by Korea Electronics Technology Institute (KETI), a spin-off institute from KITECH. The administrative work included preparing reports for the progress of the research project and for reporting details of R&D expenditures and administrative work for technical licensing fees. In addition, KITECH and ETRI carried out both the coordination of smaller consortiums and R&D in two specific fields of the whole project.

The research project was first to interpret and absorb the foreign knowledge and eventually to develop HDTV sets. The total budget for the 5 years, for 1990–1994, was 100 billion Korean won (roughly 100 million USD), with the government and the private sector to each pay a half of the total.

Right after the start of the Korean project, General Instruments (GI), a leading American firm in digital TV technology, staged a historic demonstration of the possibility of digital TV in 1990. The head of the research team at GI was a Korean American, named Dr. Woo-Hyun Paik, who later joined LG Electronics, in 1998, as the CTO (Chief

Technology Officer). Now, with the Korean research project for HDTV decisively underway, in spring 1991, digital HDTV targeted US markets, leaving behind Japanese- or European-led analogue HDTV. The problem was that the US standard was not yet determined. In this regard, one interesting strategy by the Korean team was the decision to develop several alternative standards simultaneously, with different private companies in charge of different standards. At that time, there were identified four leading standards in the US. Thus, Samsung was chosen or assigned to develop the standard by GI and the MIT coalition; LG, that by the Zenith and the AT&T coalition; Daewoo, that by RCA; and Hyundai, that by Farouja.

The public-private coalition encouraged private firms to stick to these risky R&D activities by channeling R&D funds and forming a network of researchers from firms, universities, and GRIs. In the project, there was a clear division of labor among the participating units. The whole project was divided into digital signaling (satellite and terrestrial), display (CRT, LCD, PDP), and ASIC chips (application-specific integrated circuits chips, encoding, decoding, demultiplexer, display processor). Each unit, GRI, or private firm, was assigned to different tasks with some intentional overlaps among them; namely, two units took the same task to avoid the monopoly of research outcomes. This government-led consortium had the effect of providing the private companies with the legitimacy of the project; and without this, the companies admitted, their project would have stopped because they could not have just kept pouring money into a project with uncertain cash outcomes. Furthermore, the consortium provided the firm's R&D team with the opportunity to meet and collaborate with university and other public sector researchers. The R&D staffs, during a subsequent interview, acknowledged that particularly helpful was the interaction with university professors—especially those who had just returned from the United States with a PhD degrees in digital technology-related fields.

4. CONCLUDING REMARKS AND IMPLICATIONS FOR AFRICA

4.1 The Korean Experience of Financing Industrial Development

For an effective industrial policy, state ability to control financial resources in a national economy is often critical. Financial control implies more discretionary control, such that the state, with its power in credit allocation, can control not only the financial ability of firms, but can also assure the firm's compliance in other matters, such as industrial policy implementation. In the Korean experience, the banking sector was intended to “serve” the real sector by providing

a stable supply of so-called “growth money” at affordable rates, whereas the manufacturing or production sectors always had been given priority.

Of course, such practice was possible because Korea established several development banks, such as the Korea Development Bank, Ex-Im Bank, and the Industrial Bank, and also, because most of the commercial banks were government-owned until the mid-1980s, and influenced by the government even after privatization. Additionally, manufacturing sectors often earn rents, due to entry control exerted by the government in adjusting the “optimal number of the firms” in each sector, considering the market size so that admitted firms may be guaranteed a minimum level of sorts for profits (rents) that can be invested in the next period. Thus, making the rate of return in certain industrial sectors higher than interest rates is one of the tools for industrial policy, especially when relief from high interest rates is needed.

Diverse cases of industrial policy and financing may have some policy implications for economies in Africa, which are trying to build their industrial bases. Tools of policy and financing can be different, depending upon the nature of the sectors and projects. For a project like physical infrastructure, or those with strong externality, the practices of POSCO in the Korean steel industry may be applicable. More direct intervention, in the form of SOEs, can be justified. Building oil or gold refineries in Africa can be accomplished by using these kinds of SOEs, which can be privatized later, as in the case of POSCO. Korea Air, the top airline in Korea, was also a SOE. For targeted development of certain technologies in Africa, especially for medium-sized enterprises (MEs), the bottom-up approach taken in the IBTDPs, executed in Korea’s economic past, can have useful implications, in terms of how to identify “needed technologies” by conducting firm surveys and arranging for diverse financing tools. Finally, in efforts to break into newly emerging sectors or businesses, the public–private joint R&D or foreign–domestic joint R&D practiced in Korea’s past can be a useful device of industrial policy for necessary sharing of knowledge, funds, and risks.

4.2 External Imbalances and Industrial Policy for Export Manufacturing in Africa

It is not surprising that many countries in Africa at low-income stages have had trade deficits for many years. That is basically due to weak export capabilities, compared with ever-strong demand for imported goods in African economies. Korea also went through the three decades of trade deficits, until it recorded its first trade surplus in 1986; since then, it has maintained a trade surplus (Lee 2013b).

Korea, in the early 1960s, had a 1 to 9 ratio of exports to imports, which is much worse than a typical country in Africa. Thus, Korea had a huge savings gap with the domestic savings only at 9 percent of GDP and gross investment at 15 percent of GDP, thus relying on foreign borrowing to fill the gap. This illustrates why exports are so important and are the critical binding constraints for growth for an economy at lower or middle-income stages.

Given that getting out of a trade deficit may take several decades, a country at a lower-income stage may find it necessary to take transitory measures to manage the balance of payments. In looking for specific policy tools, the past experience in Korea could be useful. In the 1960s and 1970s, Korea maintained a tight centralized control on foreign exchanges within the economy, with all export earnings (foreign currencies) first put under the control of the government (Bank of Korea), and then allocated for “justifiable uses,” like payment for imports of capital goods (Amsden 1989). One of the reasons for the tight control of foreign exchanges under the closed capital market in the early period had to do with the fact that export promotion and free capital mobility cannot work together; export promotion often involves undervaluation of currencies (or typical economic conditions in emerging economies tend to involve frequent depreciation), which is a signal or incentive for people to take their money abroad (or put their money in foreign currency-dominated bank accounts).

In these practices, imports of “non-necessaries” such as luxury consumer goods, tended to be discouraged by high tariffs, diverse non-tariff barriers, or social campaigns, and it was difficult to get permission to use dollars. For instance, even imports of foreign fruits (e.g., bananas) was discouraged by high tariffs or non-tariff barriers. In general, tariffs tended to be low for capital goods while very high for consumer goods, which Korea aimed to promote for exportable goods—which was termed as asymmetric protection in Shin and Lee (2012). Such protection was found to have significant impacts, not on TFP (total factor productivity) changes, but on the volume and market shares of the Korean export products. These practices also meant that there was a tight control of capital outflow (capital flight); for instance, ordinary people could not have their bank accounts in foreign countries, and foreign banks were not allowed to open business in Korea until the late 1980s.

Despite low income and, thus, low domestic savings, Korea maintained a higher investment rate, and one of the reasons for this was the low-interest rates, with rate hikes suppressed by the government. Despite this suppressed interest ratio, domestic savings ratio

in Korea continued to increase, owing to the growth of income associated with strong investment over the decades. This experience may have some implications for African countries, including Uganda where interest rates are currently very high, over 24 percent, in spite of inflation rates not being that high, whereas very low interest rates are applied to savings deposited into banks. This situation is very bad for private investment and reflects the asymmetric power and dominance of the lender over borrower, and also the dominance of the banking sector over the real sector. If both sides have equal power interest rates for savings should also be high. In other words, financial markets appear to be oligopolistic and imbalanced in the power of the supply and demand, and can be said to be a state of market failure, which may justify some form of government intervention. In other words, the banking sector is earning extra rents associated with oligopoly, which is quite the opposite of the desirable state of the productive sector enjoying rents, as in Korea's past, where the banking sector had always been tasked to "serve" the real sector by providing a stable supply of so-called "growth money" at affordable rates, and the manufacturing or production sector had always been given priority.

4.3 Dilemma and Prospects of the Resource-based Development in Africa

In situations in many African countries, like Uganda, despite competitive exchange rates (undervaluation or depreciation), exports tend not to respond. This situation is not so surprising, because competitive exchange rates would work only in an economy with a strong manufacturing basis. Relatedly, Ramanayake and Lee (2017) find even a negative effect of undervaluation on growth in mineral-exporting groups, and positive (no significant) effects of undervaluation in manufacture-exporting groups. This finding is consistent with the fact that if currency is more undervalued in countries that depend greatly on natural resource exports, then less income is earned in terms of dollars, because natural resource exports are often insensitive (inelastic) to exchange rates. Thus, there is an important contrast between manufacture- versus mineral-exporting countries, such that depreciation often tends to exert countercyclical effects of recovering exports and growth in economies with a strong manufacturing base (or non-negative effects on average), which is not the case in mineral-exporting economies. These mineral-exporting economies face the growth-impeding and procyclical effects of undervaluation during the times of weak performance of the economy with the typical balance-of-payment crisis. The growth-impeding and procyclical effects of undervaluation underscore the difficulties facing economic growth in mineral-exporting economies and, thus, the dilemma of the so-called "resource-based"

development model. In other words, the nature of the curse is not only the symptom associated with the Dutch disease, but also being stuck in the resource-based sector with little chance of entry into manufacturing, due to the countercyclical effects of the low valuation of currencies.

Therefore, while entry into, and promotion of, manufacturing sectors would be a desirable long-term development goal for typical countries in Africa, the condition of already-free capital mobility and already-privatized banking sectors indicates that the role of the government in promoting manufacturing would have limited impacts, except in a few countries like Ethiopia. Low valuation of currency would lead to capital flight and less domestic savings available for investment, and control of interest rates for boosting investment in industrial sectors is not that feasible under the private (or foreign) dominance of commercial banking. The situation of Kenya that recently tried a form of interest ceiling indicates the dilemma.

If domestic effort to promote exports is limited, FDI is, of course, an option but attracting FDI in the manufacturing sector has not been easy in many African countries. If this is the case, a more radical or innovative idea, for instance, for a country like Uganda, might be leapfrogging into IT service or "Smart Agriculture," bypassing the stage of manufacturing. A preceding case of leapfrogging has been happening in India, which bypassed manufacturing to leapfrog into IT service as the engine of growth (Lee 2013c, 178–205). There is also a growing recognition that agriculture is no longer a traditional industry but a "high-tech" sector, or now called the sixth industry, as a combination of the primary, secondary, and tertiary industries. It is combined with IT or digital technologies, as it braces for the benefits of new innovations, recently associated with the so-called Fourth Industrial Revolution. An example would be The Netherlands, which is leading "Smart Farming and Dairy." In 2015, its export value in agriculture was the second largest in the world, or 438 billion Euro, with a share of 20 percent in total exports of the country. Agriculture may be a more attractive sector to attract FDI than manufacturing in some African economies, like Uganda, in terms of its comparative advantages. Of course, the agro-food industry and processing segment of the primary sector industry can also be a good option for industrial development. In this regard, a good example is the case of a brand of coffee company, called "Good African Coffee," established by an entrepreneur from Uganda named Rugasira (2013), which is already successful in global market with its brands and sales network in Europe and North America. This case is important because this company does not export crude or unprocessed coffee, but high-valued, processed, and branded coffee.

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CHAPTER 10

COMPETITIVENESS AND INDUSTRIALIZATION IN AFRICA: WHAT HAVE WE LEARNED?

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1. INTRODUCTION

That industrial policy has occupied a central place in African policy space in recent years is an understatement. What has been regarded as a failed strategy, is now the buzzword in major development circles, policy entrepreneurs and policy makers. As in the past, there is unconditional endorsement while some degree of fuzziness and skepticism lingers as to what the current thinking entails with regard to introducing effective industrial strategy in Africa. In this chapter, attempt is made to summarize a few key elements that were explored in great detail in a recent research project under the theme “Learning to Compete” and reflect on the lessons for African countries in light of three most important economic fundamental gaps that need to be met to accelerate industrialization in Africa. The argument being that any effective industrial strategy should ensure to turn the competitive advantages in processing goods and services in favor of the country producing it. The fact that Africa has had little industries is not a mystery. It is the lack of effective and sustained policy coordination that denied an industrial sector from emerging in the continent. The trend however is reversing and there are clear signs of reemergence in several parts of the continent.

The policy sentiment of the day is clear and urgent. Africa has no choice but to industrialize in order to end poverty, generate employment for millions of people who join the labor force every year, and march on the path of prosperity and sustainable development. The desire to industrialize is not new to Africa. Most leaders following independence pursued industrialization to substitute imports and acquire technology. That modest effort was reversed in the 1970s when most African countries had to go through Structural Adjustment Programs. Since then, evidence suggests that most African countries have deindustrialized. For Africa as a whole, the share

of manufacturing valued added in GDP declined from 16% in 1980 to less than 10% in 2016. Similarly, Africa’s global share of manufacturing value added declined from 1.6% to 0.7% in the same period¹. The question therefore remains why little industrialization in Africa or why Africa deindustrialized?

The results of the ‘Learning to Compete’ project, elaborated in two recent books, Page et al (2015, 2016) examined three important hypothesis that have been extensively studied in the literature on industrial policy. These were : does exporting enhance competitiveness?; do industrial clusters improve productivity ?; do firms with significant FDI content learn to compete? To answer these questions, the research project analyzed firm level data for 10 African countries (Ethiopia, Kenya, Ghana, Tanzania, Mozambique, Ghana, Nigeria, Senegal, Tunisia and Uganda) and recently emerging industrial economies Cambodia and Vietnam for the purposes of comparative study. The findings confirm that indeed firms engaged in exports, and linked one way or another to the global finance through FDI learn to compete in the course of their routine business operations. In the next section a brief summary of the main results on how to enhance competitiveness is discussed. The third section looks at ‘getting the basics right’ as important first step to accelerating industrialization in Africa by identifying three important economic fundamental gaps that must be met. The fourth section concludes.

2. INDUSTRIALIZATION: WHAT HAVE LEARNED?

Exports are engines of competition

The comparison of firms that target the global market through exports with those that target the domestic market provides a natural experiment to explore whether firms producing similar products

¹ AfDB Data Portal

but serve different markets will eventually end up having different productivity levels over time. The observation that there is significant and large productivity differentials between firms that produce similar products is not new in the microeconomic literature. The problem however is that it does not mean that firms that produce several times more per unit of input are as efficient as they seem to be. There are several confounding factors in the measurement of productivity differentials between firms. Often, researchers use one input to measure productivity such as labor so that the comparison between firms is done on the basis of labor productivity differences alone. However, firms also differ by the intensity of capital, land and other inputs they use in the production process so that labor productivity differentials remain to be inadequate. A useful way to make comparisons across firms would be to use what we call total productivity that embodies all factors of production or inputs utilized by firms through a consistent and well defined production function to avoid also metric problems in aggregations of contributions of all inputs. Once total productivity measure is computed for each firm over time using panel data, then, the comparison between exporting and non-exporting firms is made on that scale. Another problem that often researchers face is that exporting firms may be intrinsically different from non-exporting firms so that there is a problem of self selection in targeting a particular market by the firms. This type of bias is real and they have to be accounted for using advanced econometric techniques.

The large empirical literature on whether firms learn by exporting settled on the following findings which are also supported in the empirical evidence for countries in Sub Saharan African under the Learning to Compete project. First, highly productive firms tend to engage in exports, meaning they self-select to enter the global market. However, once they joined, there is a productivity dividend they also get through learning. Often this is for firms from low income countries where the learning gain is large and sustained. The lesson for African countries is that while targeting the external market in and of itself is a big challenge in order to prevail and survive in the fierce competition, once a foothold is gained, there is an expanse of opportunities to grow and prosper. The question then becomes in the details of firm capabilities, management skills and other unobserved characteristics that distinguish the thriving and growing firms from that of stagnating and dying ones. In the Learning to Compete project, a mapping of firm capabilities in most African countries revealed the following features. Most manufacturing firms in Africa that have had long life expectancy are those rooted in the production of beverages, food, cement and building materials tend to be highly developed. Whereas metals

and mechanical industries have not developed. The former often cater to the local market with significant protection by government policies to substitute imports. The latter, being highly competitive in global markets, are visibly absent in Africa which demonstrates how firm capabilities in Africa are lagging behind the global norm. It is in this context that the role of Foreign Direct Investment (FDI) becomes paramount.

FDI promotes competition

One feature of firms that actively engage in the export business in Africa as compared to non-exporting firms is the active presence of foreign capital or partnerships. While the presence of international capital is a measure of confidence in the profitability and productivity of the activities of the firm (essentially good performance attracts FDI), there is a possibility that FDI permits the transfer of knowledge, particularly technical and managerial that eventually can be harnessed by firms to improve productivity. Several studies in the past have shown that managerial skills and productivity levels are highly correlated. This does not however means causality as the natural state of firms imply better management instead of the other way round. The Learning to Compete project compared firms that are exporting with some FDI content and other exporting ones with no FDI facilities. The results are robust and large productivity differential between the two where firms that enjoyed FDI content improved their productivity over time. Some of the channels in which such productivity gains are attained include knowledge transfer, particularly international practices that also include accurate and full information on regulations that often impeded African firms from accessing global markets.

Industrial clusters enhances firm productivity

Manufacturing industries tend to cluster around cities drawn by the technology they use, the markets they serve, the products and services they provide and the skills they require. Broadly speaking agglomeration economies come from two sources: localization – proximity to producers of the same commodity or service – and urbanization – proximity to producers of a wide range of commodities and services. At the risk of some simplification we can say that localization economies are the forces that drive the formation of industrial clusters, while urbanization economies are the forces that help drive the formation of cities. The Suame Magazine, the Arusha furniture cluster, and even Silicone Valley are examples of agglomerations driven by localization economies. In economies at all levels of income cities contain a high proportion of manufacturing and services firms.

In Vietnam for example the major industrial clusters are located in and near the two main urban centers, Hanoi and Ho Chi Minh City. Indeed, cities often are the hosts to several industrial clusters, as in Tunisia.

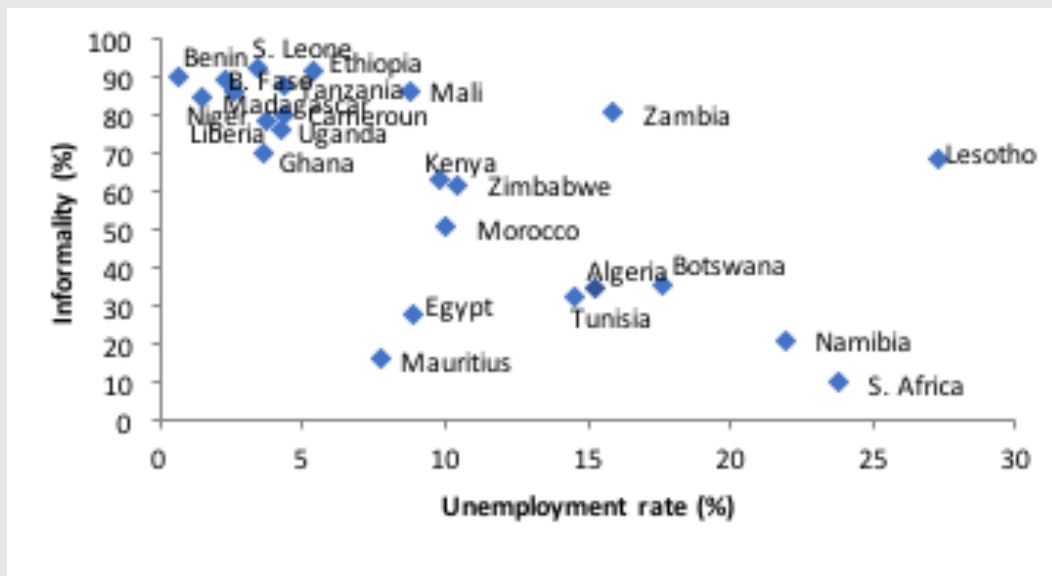
The main stylized fact documented on industrial clusters is that the concentration around a particular geographical location increases with the sophistication of technology that firms use. The more sophisticated the product, the higher the clustering. This also makes sense in that high degree of sophistication require layers of inputs from various suppliers that could be efficiently and cheaply procured within the cluster instead of produced by the firm itself. The trend that is emerging in many low income countries of creating 'industrial parks' is motivated by the successes of industrial clusters in generating dynamism, high productivity, interdependence and most importantly access to key productive inputs such as skills, power, utilities and other essentials. In Ethiopia for instance, the shoe processing industry is naturally clustered around a certain locality that led to a condition where new entrants could easily tap into productive resources at lower cost, including raw materials, skills, utilities and others.

3. GETTING THE "BASICS RIGHT": HINDRANCES TO COMPETITIVENESS

The 'trick' for success as summarized above assumes the economic fundamentals that nurture firm growth in Africa is already met. The well-known gap in economic fundamentals between Africa and the rest of the world revolve around three main areas which are illustrated below in brief: skill gap, infrastructure gap and institutional effectiveness gaps. The three gaps underpin the potential of Africa's industrialization effort going forward. The skill gap often is misconstrued with level of education gap, even though it is still very important. Several studies have shown that the African labor market's inherent problems start with the mismatch between skills demanded by employers and the supply of skills readily available. As a result, the labor market structure in Africa gravitated towards informality or self-employment in poor countries and unemployment in middle income countries (see Figure 10.1). Such structural features are not conducive for promoting industrial development in Africa.

One of the defining characteristics of African educational system in most countries is its emphasis in catering the public sector instead of the modern private sector. As such therefore, the skills and

Figure 10.1: Unemployment and informality in Africa



Source: Page and Shimeles (2016)

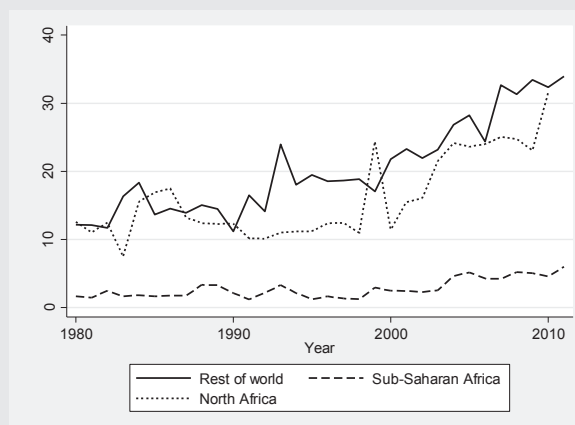
training even at tertiary level focus on subjects like humanities, administration, political science, etc with fewer graduates in applied sciences, engineering, architecture, etc. Most importantly, even the trend in tertiary education has been lagging significantly behind from other parts of the world so that there is a lot of catching up to do for Africa (Figure 10.2).

One of the key factors retarding industrialization in Africa has been lack of critical infrastructure, such as power, water and transport services that allows firms competitive advantage over their peers in other regions. The advantage of 'backwardness' in the case of most low income African countries is undermined and counteracted by weak infrastructure.

Unfortunately, Africa has made very slow progress to develop its infrastructure which is crucial for it to prevail in the global competitive market. The current state of infrastructure in most countries is pitiful. According to recent studies, Latin America and Asia have twice and four times the length of paved road compared to Africa's 16 percent. Only one in three Africans have access to electricity, while comparable figures in the rest of the developing world place access rates at 90 percent. Compared to other parts of the world, electricity in Africa is expensive and unreliable. Furthermore, despite rapid expansion in the use of mobile phones and applications of mobile technology, internet penetration, a lifeline for modern trade, communications and applications of technology in almost all sectors, has been progressing extremely slowly in Africa in the past decade (Figure 10.3).

It is estimated that poor infrastructure shaves up to 2 percent off Africa's average per-capita growth rates ². Only firms with very high returns and engage in well controlled markets can make profit by operating out of Africa. These are well known: extractive industries engaged in mining, oil production, and allied activities are the usual suspects. Firms with high value addition, broad job opportunities, and wide sectoral linkages face serious setbacks to operate in Africa. There is no other way around than fixing the infrastructure deficit in order to embark on industrialization. The table below is telling of the adversities firms face in Africa due to difficulties in powering their production operations. On the average, electricity blackout occurs a quarter of times in a year significantly increasing down time or exposing firms to costly energy substitute such as private generators. Progress thus far in this area has been very slow. Surveys conducted in 2014 have shown that still close to 60% of firms operating in

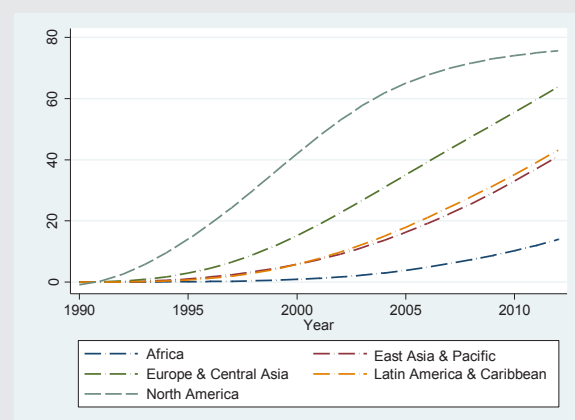
Figure 10.2: Skill differential between Africa and the Rest of The World



Source: Author's computations based on Africa Data Portal and World Development Indicators various years

Africa consider infrastructure (power shortage/cost and transport bottlenecks) as the most binding constraint they face in their daily operation. Studies have shown that even if most African countries

Figure 10.3: Internet Penetration in selected regions of the world



Source: Author's computations based on Africa Development Bank Data Portal.

2 See also AfDB Infrastructure statistics: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/AfDB%20Infrastructure_web.pdf

Table 1: Impact of unreliable infrastructure services on the productive sector

Service problem	Sub-Saharan Africa	Developing countries
<i>Electricity</i>		
Delay in obtaining electricity connection (days)	79.9	27.5
Electrical outages (days per year)	90.9	28.7
Value of lost output due to electrical outages (percent of turnover)	6.1	4.4
Firms maintaining own generation equipment (percent of total)	47.5	31.8
<i>Telecommunications</i>		
Delay in obtaining telephone line (days)	96.6	43.0
Telephone outages (days per year)	28.1	9.1

Source: Page et al (2016).

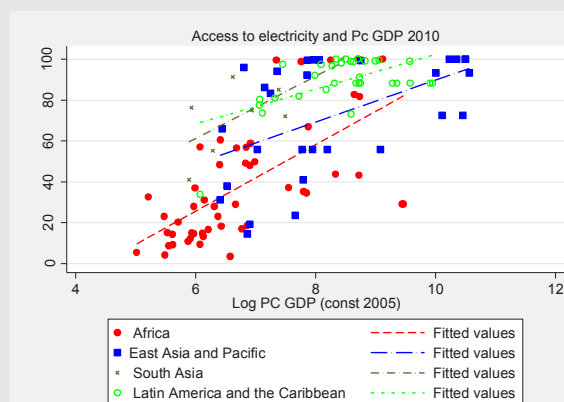
enhanced their electricity generation capacity, progress in power distribution has been painfully slow, actually making the generated electricity unusable for productive purposes.

The consequences of poor infrastructure is not just limited to opportunity cost in terms of lost growth, but also in retarding human development. Recent evidence³ suggests that higher child mortality is driven by low access to basic services, such as electricity and clean water.

The productivity loss as well as the cost on human development brought about by poor infrastructure is not to go away without commitments by policy makers and leaders to embark on ambitious investments in the sector. To illustrate the point, Figure 10.2 presents correlations between access to electricity and long term development (proxied by log real per capita GDP) in selected regions of the world. First, on the average, African countries had lower access to electricity irrespective of the level of development, suggesting that what really matters is determination of countries to invest in power generation rather than their ability to afford it, which still is important. Secondly, to strengthen this point, there are some African countries that were able to provide access to electricity for large segment of their population, almost close to the East Asia average, while being relatively poorer. These points illustrate that policy action and determined political will may be more important than a country's ability to afford investments in infrastructure.

Despite the limitations outlined above, there is however some good news. The momentum at least at the level of policy makers to remove constraints inhibiting industrialization has been rising. The first significant event is the Action Plan⁴ drawn by African Ministers of Industry hosted by the African Union in 2007 which outlined a list

Figure 10.4: Access to power is not just a matter of lack of finance



Source: Author's computations based on AfDB Data Portal and World Development Indicators various issues.

3 Shimeles, A and Nabasaga, T (2017), "Why is inequality high in Africa?", forthcoming, Journal of African Economies

4 <https://www.google.com/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=infrastructure%20impediments%20for%20industrial%20development%20in%20africa>

of actions to be taken to address key bottlenecks affecting industrialization in Africa which included poor state of infrastructure.

If recent trends continue Africa may be able to close its acute infrastructure gap. Since 2008, close to 45 billion USD per year has been spent in infrastructure up from less than USD 20 billion in 2000. However, this is half what is needed to close the infrastructure gap in the next 30 years. Still it is a good progress. External finance has tripled also during this period, mainly coming from China. The shift in the focus of most governments in Africa to step up their infrastructure needs also helped spur growth. According to the African Economic Outlook (2015), infrastructure was a significant contributor to GDP growth in nearly half of the African countries during 2012 and 2013.

On its part, the African Development Bank devoted 60% of its portfolio on infrastructure projects since 2009. In the last five years alone it has spent 6 billion USD to power Africa. Recently the Bank also launched a New Deal on energy to increase access to electricity from about 25% of its current level to almost 100% by 2025.

The other third gap most African countries need to address is building business friendly institutions that encourages the private sector to operate unhindered. Often, high risk of expropriation, or other coercive behavior impose high premium on the type of firms a country attracts to thrive in its economy. Therefore, there is a high degree of correlation between a country's competitiveness and governance conditions (Figure 10.5).

It can be disputed, quite legitimately, that the above correlation is driven by say a third factor such as differences in per capita GDP levels. After all, relatively richer countries have the resources and means to build better working institutions which in turn can improve the degree of competitiveness. To address this concern is not easy. Still we argue that competitiveness and overall quality of institutions are strongly linked even after we purge out the effects of differences in per capita GDP levels (Figure 10.6) underscoring the fact that countries with significant institutional quality gap will be lagging in their effort to industrialize their economies.

4. REFLECTIONS ON POLICY IMPLICATIONS

From the discussion above, it can be inferred that successful industrial policy requires both sectoral focus as well as getting the 'basics right'. Separating the two may be hard, but it is essential for countries to identify optimal combinations of policy actions needed to nurture an industrial program. The broad lessons are that the

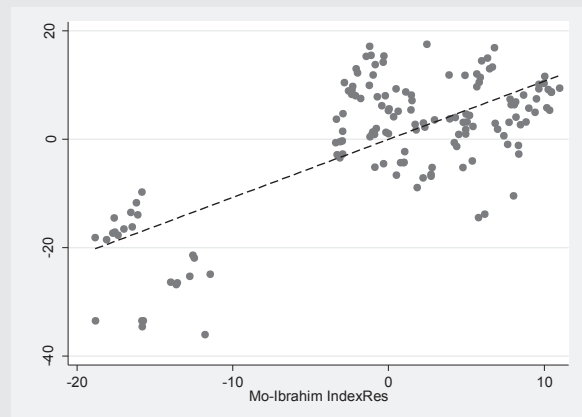
Figure 10.5: Competitiveness and overall governance conditions in Africa



Source: Authors computations

current global economic architecture affords opportunities for African countries to leap frog and accelerate industrialization efforts through careful experimentation of what has worked elsewhere and adopting it to their local conditions. In the studies examined, firm survival and growth in Africa is closely linked with exporting, working with international capital and international or global firms,

Figure 10.6: Competitiveness and overall governance with per capita GDP controlled



Source: Authors computations based on data from Doing Business various issues and Mo Ibrahim Governance indicators.

adopting to international managerial norms and standards as well as developing industrial clusters. These elements come in different shades depending on the type of firms involved and technology intensities. Most importantly however the three economic fundamental gaps identified in this chapter need also very important attention: skill gaps; infrastructure gaps and overall institutional quality gaps.

These factors seem obvious and often repeated in the discourse. However in practice they have different resonance. For example, a country may not need to meet all these requirements at the same time everywhere in its economy. The idea of 'industrial parks' are invented to circumvent such all-out reforms that eventually become 'mission impossible' for many countries. However, industrial parks offer countries an opportunity to close all gaps at a highly concentrated, small area interventions and use the lessons from these

parks as 'best practices' going forward to avoid wastage and cost of learning that often is prohibitive at a national scale. For instance, in industrial parks, a country can afford to provide all types of skills for particular industries (since it has also a choice of industries based on its own comparative advantage), infrastructure that prevents a lot of wastage; and well-functioning and efficient institutional support targeted for industries in the park that could match international standards. From such small steps, then, a country can eventually achieve dynamic industrial sector by combining sector and industry specific support without necessarily overhauling the entire ecosystem at once. This is a bit in favor of gradualism and experimentation over radical reforms in accelerating industrialization in Africa which may be necessary in some contexts.



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