Research Paper

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Industrialization in Africa: Issues and Policies

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This paper reviews the past performance of industrialization in Africa and identifies key considerations for policymaking. To date, African countries have lagged in industrialization compared to other continents, in spite of the determined efforts and aspirations of their leaders. However, recent evidence suggests that Africa's de-industrialization trend began to reverse in the past decade, with some countries experiencing growth in manufacturing employment. Notably, more jobs have emerged in micro, small, and medium-sized enterprises, than in large, formal businesses where productivity is generally higher.

Hence, African countries must design development strategies that balance job creation with productivity growth—the foundation of sustainable economic growth. Solely adopting traditional export-oriented industrialization through foreign direct investment (FDI) will not adequately address critical employment concerns, considering Africa's predominantly young population. Conversely, only expanding indigenous, informal economic activities to accommodate the growing labor pool will not bolster long-term economic growth, especially as advanced manufacturing technologies have become more capital-intensive and require specific skills.

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RESEARCH PAPER

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ABSTRACT

This paper reviews the past performance of industrialization in Africa and identifies key considerations for policymaking. To date, African countries have lagged in industrialization compared to other continents, in spite of the determined efforts and aspirations of their leaders. However, recent evidence suggests that Africa's de-industrialization trend began to reverse in the past decade, with some countries experiencing growth in manufacturing employment.

Notably, more jobs have emerged in micro, small, and medium-sized enterprises, than in large, formal businesses where productivity is generally higher. Hence, African countries must design development strategies that balance job creation with productivity growth—the foundation of sustainable economic growth. Solely adopting traditional export-oriented industrialization through foreign direct investment (FDI) will not adequately address critical employment concerns, considering Africa's predominantly young population.

Conversely, only expanding indigenous, informal economic activities to accommodate the growing labor pool will not bolster long-term economic growth, especially as advanced manufacturing technologies have become more capital-intensive and require specific skills. A balanced approach would incorporate the promotion of FDI-driven enterprises to elevate productivity in the formal sector, while simultaneously fostering labor-intensive domestic economic activities. Embracing digitalization to bridge these sectors is essential. Policymaking should be pragmatic, drawing from case studies that delineate effective practices under distinct conditions. This paper provides policy recommendations based on such studies.

I.   INTRODUCTION

There is broad consensus that Africa needs robust economic growth in order to create jobs and generate prosperity. Historically, industrialization has served as a reliable pathway to such growth. The December 2015 Paris Agreement, the Addis Ababa Action Agenda, the 2030 Agenda for Sustainable Development Goals (SDGs), and the African Union's 2063 Agenda all spotlight the role of industrial growth in economic progress.

However, thus far, delivering industrialization has proved challenging. Over the past decade, Africa's manufacturing performance has underperformed relative to its potential, a situation exacerbated by the ramifications of the COVID-19 pandemic. In its aftermath, African policymakers have grappled with more pressing concerns—i.e., surging food and energy prices due to the Ukraine conflict, dwindling global export demand, disrupted value chains, and mounting external debt. Understandably, industrialization has been less of a focus in the wake of such priorities, yet it remains essential for sustained economic growth.

In the past, Africa has shown limited progress in manufacturing value addition and employment, reflecting the de-industrialization trends observed in developing countries (Rodrik, 2016). However, sub-Saharan African countries saw a revival of growth in manufacturing employment between 2010-2018 (Kruse et al, 2021), reversing a decline that spanned from 1960 to 2010. This upturn was largely attributable to small, informal enterprises serving local demands. Larger, more-productive firms were not primary job providers, while smaller informal firms that employed more local residents had lower productivity (MacMillan and Zeufack, 2022). The industrial growth path differed by country, shaped by external demand in nations like Ethiopia, and by domestic demand in resource-rich countries like Tanzania (Diao et al, 2021).

Productivity growth in low-income countries is often driven by structural transformation—the movement of resources from less to more productive sectors. In Africa, this factor accounted for 74% of productivity growth before the 2008 Global Financial Crisis (Dieppe, 2021). Unfortunately, this share was reduced to 52% pre-COVID-19, as labor gravitated more towards services than manufacturing. This trend is concerning since, historically, structural transformation has been pivotal for productivity growth in low and lower-middle-income countries.

Following a quick review of the nature and role of industrialization in Africa (section 2), the paper evaluates the performance of African manufacturing during the past decade (section 3). The evolution of labor productivity over the last three decades is then analyzed, using the sector decomposition method (section 4). The paper then reviews recent research on Africa's industrialization and the new economics of industrial policy (section 5). Section 6 proposes strategies and policies that African countries might consider, in order to capitalize on industrialization opportunities. Section 7 presents a combination of successful and unsuccessful case studies, proposing actionable strategies for promoting sustainable structural change and enhancing productivity across enterprises of all sizes. Section 8 concludes by considering potential support actions from the global community.

II. THE NATURE AND ROLE OF INDUSTRIALIZATION IN AFRICA

For the purposes of this paper, 'industry' is exclusively defined as the manufacturing sector, excluding other industrial sub-sectors, including mining, construction, and utilities. 'Africa' refers to sub-Saharan Africa (SSA), unless otherwise indicated.

Industrialization and Diversification. Current data clearly reveals Africa's dire economic landscape. On average, the continent's 10 poorest nations source 12% of their revenues from natural resource rents. When juxtaposed with middle-income (4.7%) and high-income (1.9%) countries, the disparity is evident. Notably, the resource dependency of many of these countries remains as pronounced today as it was three decades ago. Such patterns suggest the lingering ramifications of a resource curse, trapping nations in a relentless dependency cycle (Sachs and Warner, 2001).

Figure 1

Natural Resource Rents (% of GDP) in 2020-2021
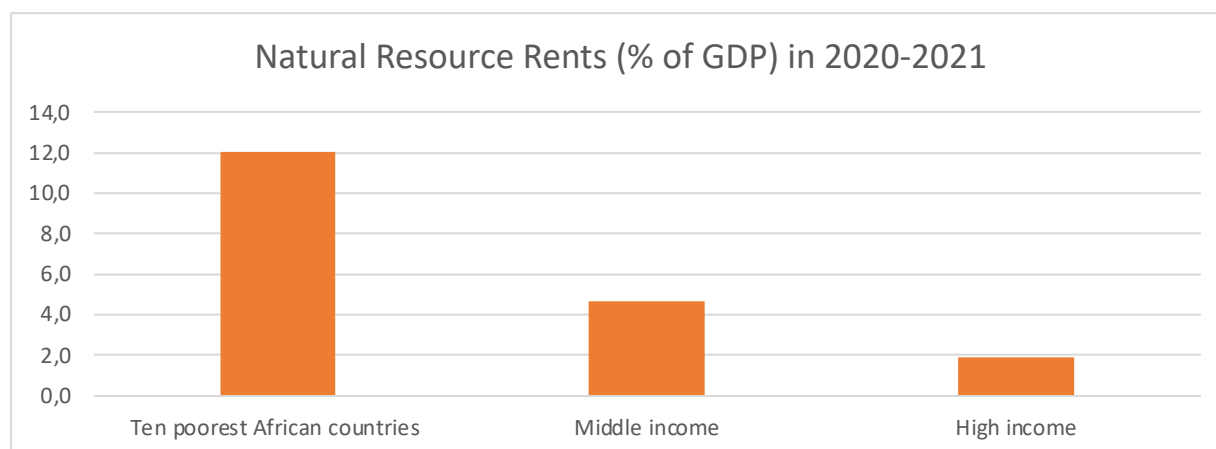
Source: World Development Indicators; last updated: 07/25/2023, accessed August 30, 2023.

Natural resource rents (specifically non-renewable) are defined as the difference between the costs of production and the estimated revenue from the sale of fossil fuels or minerals (World Bank, 2021, p. 198). Since natural resources are not produced, they create economic rents. Rents from nonrenewable resources represent the liquidation of a country's capital stock. If countries use these rents to support current consumption, rather than to invest in new capital to replace what is being used, they are, in effect, borrowing against the future.

A concerning trend emerges upon analyzing the data. For over five decades, starting from the 1970s when relevant data became accessible, the resource dependency of SSA countries has persisted. Figure 2 shows that Africa's total natural resource rent represents about 8% of GDP, in contrast to 4% for Latin America, and 2% or less for South Asia and East Asia.

Figure 2
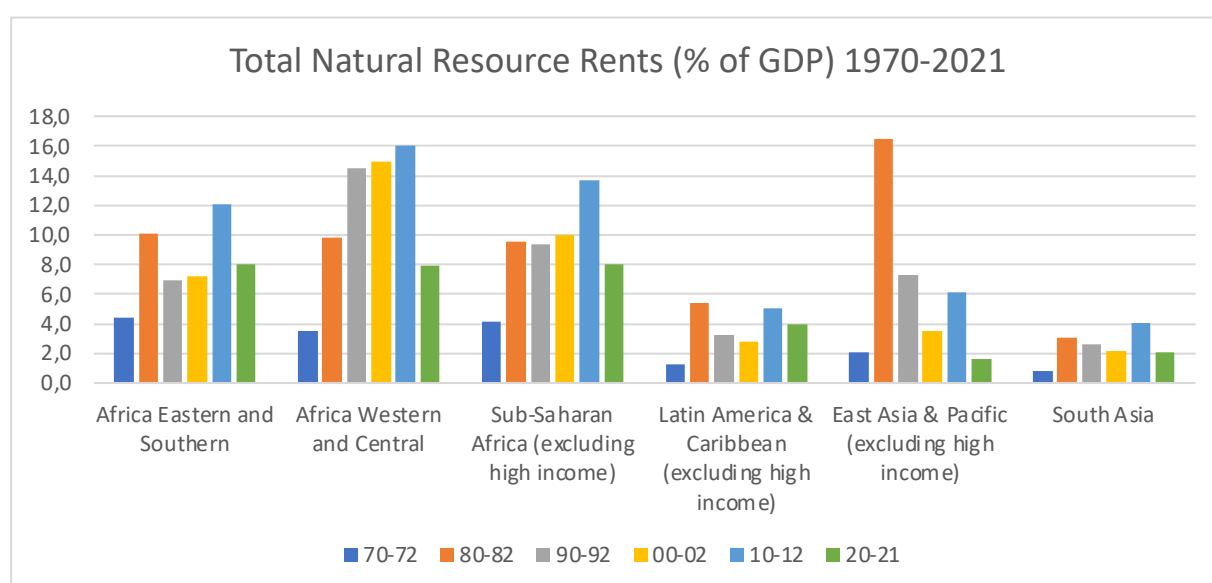
Source: Data from database: World Development Indicators; last updated: 07/25/2023, accessed August 30, 2023.

Figure 3 emphasizes this trend, with a focus on mineral rents. Over the past decade, only Africa and Latin America have witnessed an uptick in this dependency. As Gylfason (2001) highlighted, by the beginning of the twenty-first century, only four of the 65 resource-rich developing nations—Botswana, Indonesia, Malaysia, and Thailand—had succeeded in long-term investments surpassing 25% of their GDP, along with an average GDP growth rate over 4%. Notably, the three Asian nations achieved this through economic diversification and industrialization.

Figure 3

Mineral Rents (% of GDP) 2010-2012 and 2020-2021
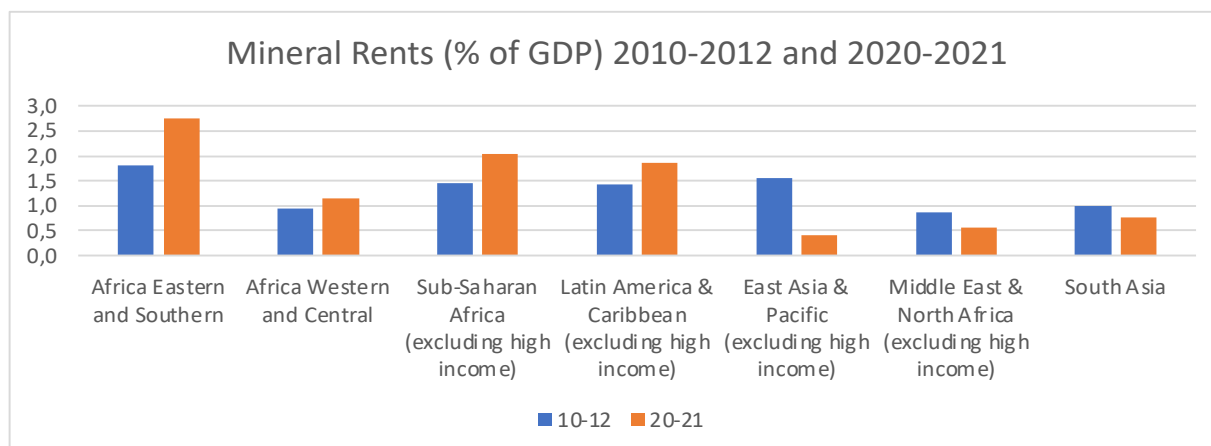
Source: World Development Indicators; last updated: 07/25/2023, accessed August 30, 2023.

III. PERFORMANCE OF AFRICA'S MANUFACTURING SECTOR

Until the last decade, sub-Saharan Africa mirrored a global trend of de-industrialization in developing countries (Rodrik, 2016), showing limited progress in manufacturing value addition and employment. Table 1 shows the average annual growth rates of manufacturing value-added in various African sub-regions and other regions.

Table 1

Manufacturing Value-Added in Constant Millions 2015 Dollars and Annual Growth Rate (%) for Various Regions 2010-2022

	2010	2021	2022	Annuel Percentage Growth 2022-2010	Annuel Growth before Covid 19 2019-2010
Sub-Saharan Africa (excluding high income)	130,322.8	184,898.8	189,204.9	2.8%	3.8%
Africa, Eastern and Southern	80,260.4	99,134.7	101,135.7	1.8%	2.6%
Africa, Western and Central	50,755.0	85,859.2	88,203.4	4.0%	5.3%
Latin America & Caribbean (excluding high income)	590,991.1	625,264.6	645,688.7	0.2%	0.3%
Europe & Central Asia (excluding high income)	326,057.3	518,096.0	518,331.5	3.5%	3.5%
Middle East & North Africa (excluding high income)	195,591.4	208,540.8	n/a*	0.7%	0.7%
Low income	28,047.3	47,759.5	49,531.4	5.3%	6.1%
Lower middle income	664,109.4	1,089,563.7	1,121,105.4	4.6%	5.2%
World	11,130,188.3	13,980,980.5	n/a*	2.0%	2.3%

Source: Author's calculations from World Development Indicators, updated July 25, 2023, August 19, 2023 - Note: Annual Growth rates is calculated using regression* indicates growth rate calculated until 2021

From2010-2022, the manufacturing value added of sub-Saharan Africa (excluding high-income countries) expanded by 2.8% annually (Table 1). This is relatively low compared to 5.3% for low-income countries and 4.6% for lower-middle-income countries. Pre-COVID-19, Africa's growth rate of 3.8% also trailed its counterparts (6.1% and 5.2%, respectively). It's worth noting that other regions, including Latin America, the Middle East and North Africa, also performed underwhelmingly.

Thus, the global share of Africa's manufacturing output remained relatively constant (as seen in Figure 4, left panel). In 2010, the manufacturing output of sub-Saharan Africa (excluding high-income countries) was around $143.2 billion in current prices, or 1.35% of global output. By 2022, this output increased to about $230 billion or 1.41%, a marginal increase. Encouragingly, the average share of manufacturing in GDP did rise modestly in the 2010s compared to the 1990s, contrary to the decline observed in the 2000s (Figure 4, right panel). This offers a glimmer of hope for potential industrial resurgence in Africa.

Figure 4
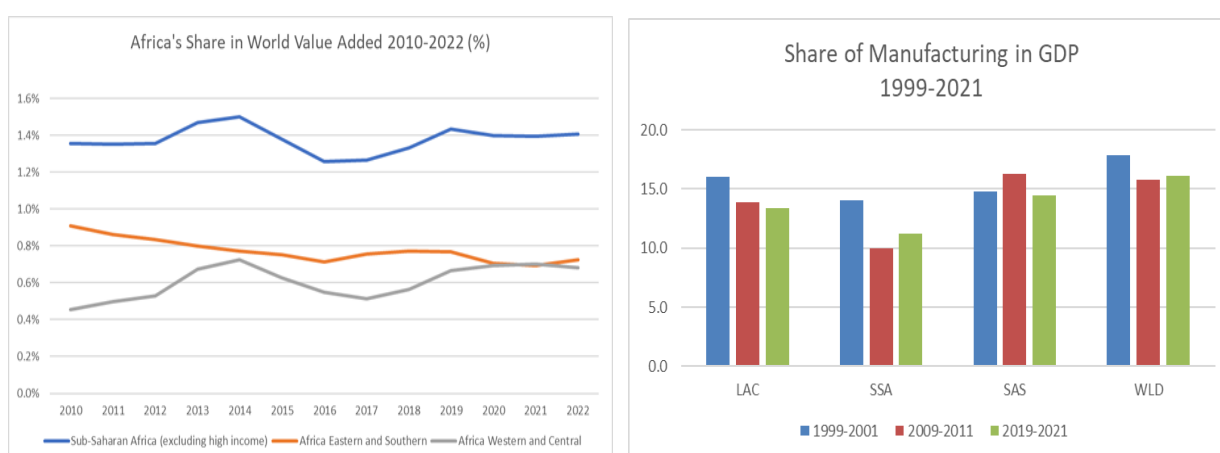
Source: World Development Indicators, accessed August 19, 2023.

However, manufacturing performance in different countries varies significantly. Table 2 lists the average annual growth rates of manufacturing value-added for SSA countries during two periods: 2000-2010 and 2010-2022. This analysis uses regression to account for annual variations. Among the 31 countries for which data is accessible, only 11 displayed an upswing in annual growth of manufacturing value-added, with Togo, Ethiopia, and and the Democratic Republic of the Congo at the forefront. Conversely, oil-producing countries like Gabon and the Republic of Congo lagged in comparison. Overall, manufacturing value-added growth rates have declined in most African countries.

In fact, the annual average growth rate for this group of SSA countries decreased from 4.5% to 3.1%. Although COVID-19 undoubtedly impacted these figures, it's important to note that even before the pandemic, the manufacturing growth rate for these countries had already decreased to 3.9% (Table 2). Among the top performers, Togo, Ethiopia, DRC, Benin, and Niger each maintained an average growth rate exceeding 4% annually over the span of 12 years, even when taking into account the impact of COVID-19. In stark contrast, nations including Mozambique, Botswana, Namibia, the Gambia, Republic of Congo, and Gabon experienced consistent annual declines of more than 4%.

Table 2

| Manufacturing Value-Added Annual Growth Rate in SSA (%)					
Country Name	**2010-2000** (1)	**2022-2010** (2)	(2)-(1)	**2019-2010** (3)	(3)-(1)
Angola	6.9%	3.0%	-3.9%	4.1%	-2.8%
Benin	0.1%	4.9%	4.8%	4.6%	4.5%
Botswana	5.1%	0.0%	-5.0%	0.9%	-4.1%
Burkina Faso	5.1%	4.4%	-0.7%	4.3%	-0.8%
Cabo Verde	1.7%	1.9%	0.3%	2.6%	0.9%
Cameroon	5.5%	3.7%	-1.8%	4.2%	-1.3%
Congo, Dem. Rep.	-0.9%	5.1%	5.9%	7.1%	8.0%
Congo, Rep.	8.8%	-3.5%	-12.3%	-3.5%	-12.3%
Eswatini	3.8%	2.1%	-1.7%	2.5%	-1.3%
Ethiopia	7.9%	13.9%	6.0%	16.4%	8.5%
Gabon	26.8%	2.9%	-23.9%	3.5%	-23.2%
Gambia, The	3.3%	-6.3%	-9.6%	-0.8%	-4.1%
Kenya	3.8%	3.0%	-0.9%	3.1%	-0.7%
Lesotho	4.6%	1.4%	-3.2%	1.6%	-3.0%
Mauritania	0.6%	2.4%	1.9%	2.6%	2.1%
Mauritius	1.3%	0.3%	-1.1%	1.4%	0.1%
Mozambique	7.2%	2.6%	-4.6%	3.5%	-3.7%
Namibia	5.6%	0.0%	-5.6%	1.6%	-4.0%
Niger	2.4%	6.9%	4.5%	7.5%	5.2%
Nigeria	1.2%	4.0%	2.8%	6.2%	4.9%
Rwanda	8.0%	5.7%	-2.2%	4.5%	-3.5%
Sao Tome and Principe	5.1%	2.4%	-2.7%	2.6%	-2.6%
Senegal	1.5%	3.7%	2.3%	3.9%	2.4%
Seychelles	-2.1%	2.4%	4.4%	1.4%	3.4%
Sierra Leone	3.0%	1.9%	-1.1%	2.3%	-0.7%
South Africa	2.8%	-0.4%	-3.2%	0.5%	-2.3%
Tanzania	8.6%	6.7%	-1.8%	7.4%	-1.1%
Togo	2.5%	14.2%	11.7%	15.7%	13.2%
Uganda	6.8%	3.8%	-3.1%	3.8%	-3.0%
Zambia	4.9%	4.3%	-0.7%	5.0%	0.0%
Zimbabwe	-3.7%	-1.8%	1.8%	0.1%	3.8%

Source: Author's calculation from World Development Indicators, updated July 25, 2023, accessed August 19, 2023 - Growth rates of value-added at constant 2015 prices are calculated using regression

Given the varied performance across SSA countries, it is challenging to generalize for the entire continent. However, it's reasonable to conclude that Africa's manufacturing growth over the past decade has not reached its full potential, presenting an opportunity for rapid growth in the future.

Figure 5 illustrates the relationship between manufacturing value-added and GDP growth for African countries, both before and after 2010. This data, sourced from the World Bank, indicates a strong correlation between these two metrics. Out of the 32 countries for which data is available, 12 exhibited a higher growth rate in manufacturing, while 10 showed a higher GDP growth rate.

Figure 5

SSA Average Annual Growth Rates (%) of GDP (red)and Manuf. VA (Blue), Pre-2010 and Post-2010 Periods
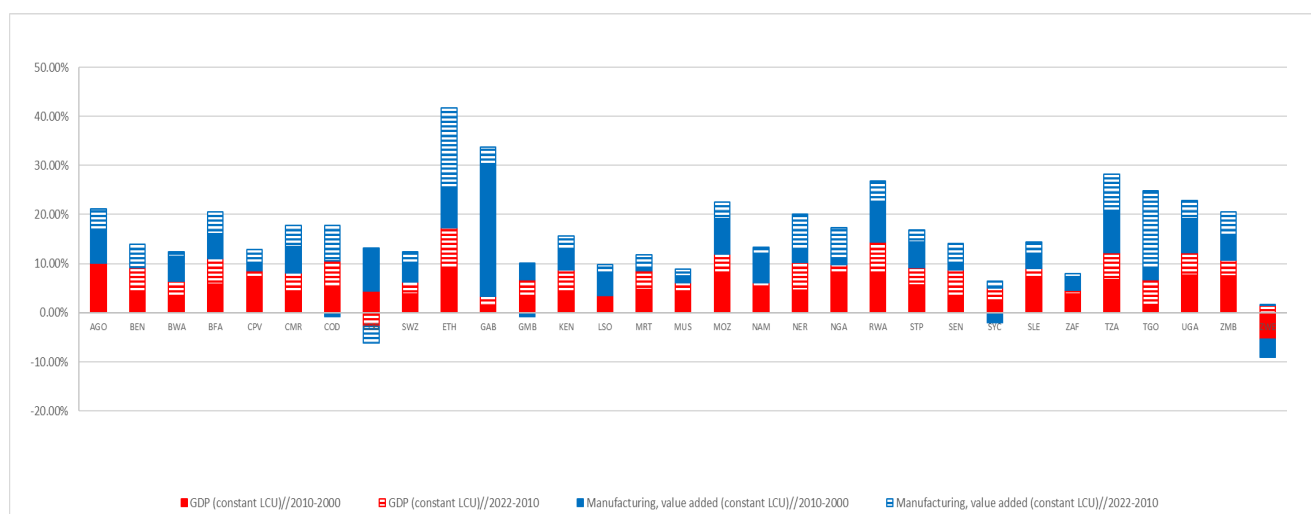
Source: Author's calculations from World Development Indicators, accessed August 19, 2023.
Note: Growth rates at constant 2015 prices are calculated using regression.

Employment. Industrialization is important for SSA in the context of the imperative to create jobs for its burgeoning population of young people. As of 2021, SSA was home to 1.2 billion people, with 42% under the age of 14, according to the 2023 World Development Indicators. This positions Africa as the world's youngest continent. Forecasts suggest that this population will double by 2050, reinforcing the urgency of creating productive job opportunities for the millions of young Africans entering the workforce annually.

However, data paucity in employment for African countries presents challenges. While the World Bank offers comprehensive GDP data and sectoral value-added for SSA, it lacks data on sectoral employment. The University of Groningen, in collaboration with the United Nations University-World Institute for Development Economics Research (UNU-WIDER), has developed the Economic Transformation Database (ETD). This database provides time series data on employment and value added for 12 sectors across 51 countries, including 18 from SSA. However, it covers only 1990-2018, missing out on more recent events like the COVID-19 pandemic. Furthermore, its data source for value added differs from that of the World Bank.

Table 3

SSA Countries in the Transformation Database and their Manufacturing Value Added and Employment Annual Growth Rates 2010-2000 and 2018-2010

Country	Annual Growth Rates of Manufacturing Value-Added in 2015 Prices		Annual Growth Rates Manufacturing Employment	
	2000-2010	2010-2018	2000-2010	2010-2018
Botswana	5.0%	3.5%	-2.2%	2.0%
Burkina Faso	5.1%	4.7%	8.6%	17.8%
Cameroon	4.9%	4.4%	6.9%	2.4%
Ethiopia	7.8%	16.8%	11.2%	6.9%
Ghana	3.4%	3.9%	2.8%	8.2%
Kenya	2.1%	1.0%	5.4%	2.0%
Lesotho	4.7%	2.1%	6.7%	2.3%
Malawi	8.0%	3.2%	9.7%	-0.5%
Mauritius	1.2%	1.5%	-3.0%	-0.4%
Mozambique	7.2%	3.7%	2.0%	-1.7%
Namibia	5.6%	0.5%	2.4%	7.7%
Nigeria	1.2%	7.2%	2.4%	12.4%
Rwanda	7.3%	3.9%	9.3%	9.3%
Senegal	2.5%	4.5%	6.8%	4.5%
South Africa	2.7%	0.8%	0.3%	-0.7%
Tanzania	8.7%	7.7%	11.7%	3.3%
Uganda	6.7%	3.1%	-0.4%	5.0%
Zambia	6.2%	4.7%	5.7%	7.9%
Unweighted averag	**5.0%**	**4.3%**	**4.8%**	**4.9%**

Source: Author's calculations from the Economic Transformation Database, Note: Growth rates of value-added at constant 2015 prices and of emplyment are calculated using regression

Despite these differences, insights can still be garnered by utilizing both datasets. For instance, the value-added data in the two databases align for nations that have made industrialization strides, such as Ethiopia and Tanzania.

Table 3 indicates a deceleration in the growth rate of value added for SSA countries, from 5.0% to 4.3% post-2010. Conversely, employment growth edged up slightly to 4.9%. Countries including Cameroon, Ethiopia, Senegal, and Tanzania witnessed a marked deceleration in job creation post-2010. However, Burkina Faso, Ghana, Namibia, and Nigeria saw employment growth. Figure 6 shows the yearly growth of manufacturing employment for these 18 SSA countries, during 2000-2010 (solid red) and 2010-2018 (striped red).
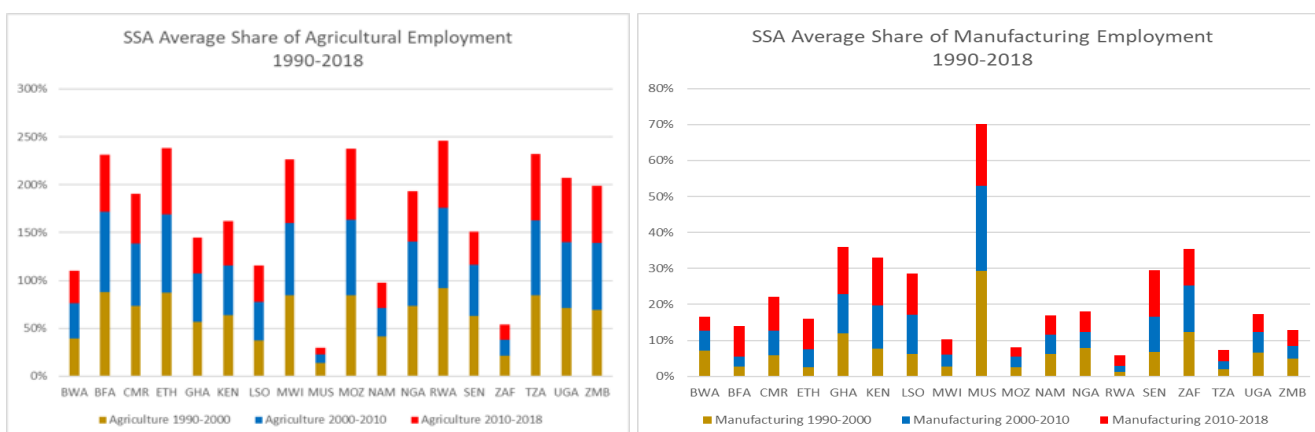
Figure 6
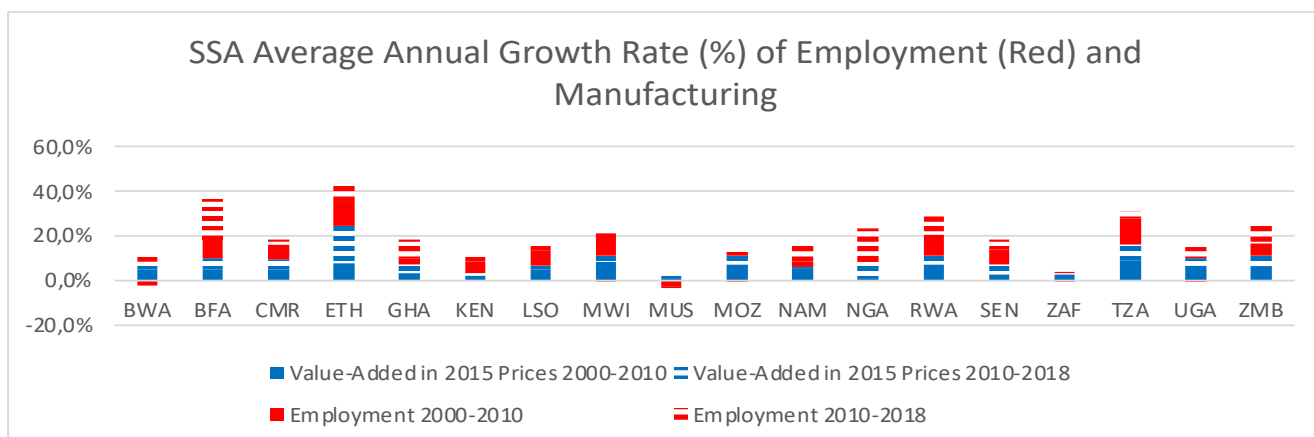
SSA Average Annual Growth Rate (%) of Employment (Red) and Manufacturing

Source: Author's calculations from the Economic Transformation Database, 2021 (de Vries et al, 2021). Growth rates are calculated from regression.

One metric for evaluating Africa's industrialization progress is the employment share of agriculture over time. A transition from agriculture, which has the lowest productivity among all sectors, can signal an improvement in resource allocation. Figure 7 plots the average employment share in agriculture and manufacturing for SSA countries across three decades: 1990-2000, 2000-2010, and 2010-2018. Countries that achieved a significant 50% reduction in agricultural employment over the past three decades include Mauritius, Senegal, Namibia, and Ghana. When it comes to bolstering the manufacturing employment share, Ethiopia, Burkina Faso, Rwanda, Senegal, and Lesotho lead.

Figure 7

Changes in SSA Agricultural and Manufacturing Employment Shares 1990-2018

Source: Author's calculations from the Economic Transformation Database, 2021 (de Vries et al, 2021). Growth rates are calculated from regression line.

Kruse et al (2021) employed the Economic Transformation Database (ETD) to assess industrialization trends in developing nations. They observed that between 2010-2018, SSA's manufacturing employment

share grew by 1.2 percentage points to 8.4%[1]. This uptick contrasts with a persistent industrialization decline from 1960-2010. Notably, this employment growth largely occurred in unregistered small firms catering to domestic markets. These firms span a spectrum from those using traditional, less-productive technologies to those employing modern techniques.

This trend also aligns with the observations of Diao et al (2021), who identified a dichotomy: larger, high-productivity firms are not major labor absorbers, whereas smaller, unregistered firms increase employment but have lower productivity. This pattern is further confirmed by McMillan and Zeufack (2022). For a broader perspective, Figure 8 presents a comparative analysis of sectoral shares for Asia and Latin America. In Asia, countries with the most significant reductions in agricultural employment shares are developed economies including Hong Kong, Korea, Taiwan, Singapore, and China. In turn, Cambodia, Vietnam, Nepal, Laos, and Bangladesh recorded the most substantial gains in manufacturing employment. For Latin America, nations such as Bolivia, Brazil, Argentina, and Chile saw the most remarkable reductions in agricultural employment shares. Meanwhile, countries including Chile, Costa Rica, Peru, Argentina, and Mexico registered the highest increases in manufacturing employment shares.

Figure 8

Changes in Agricultural and Manufacturing Employment Shares between 1990-2018, in Asia and Latin America
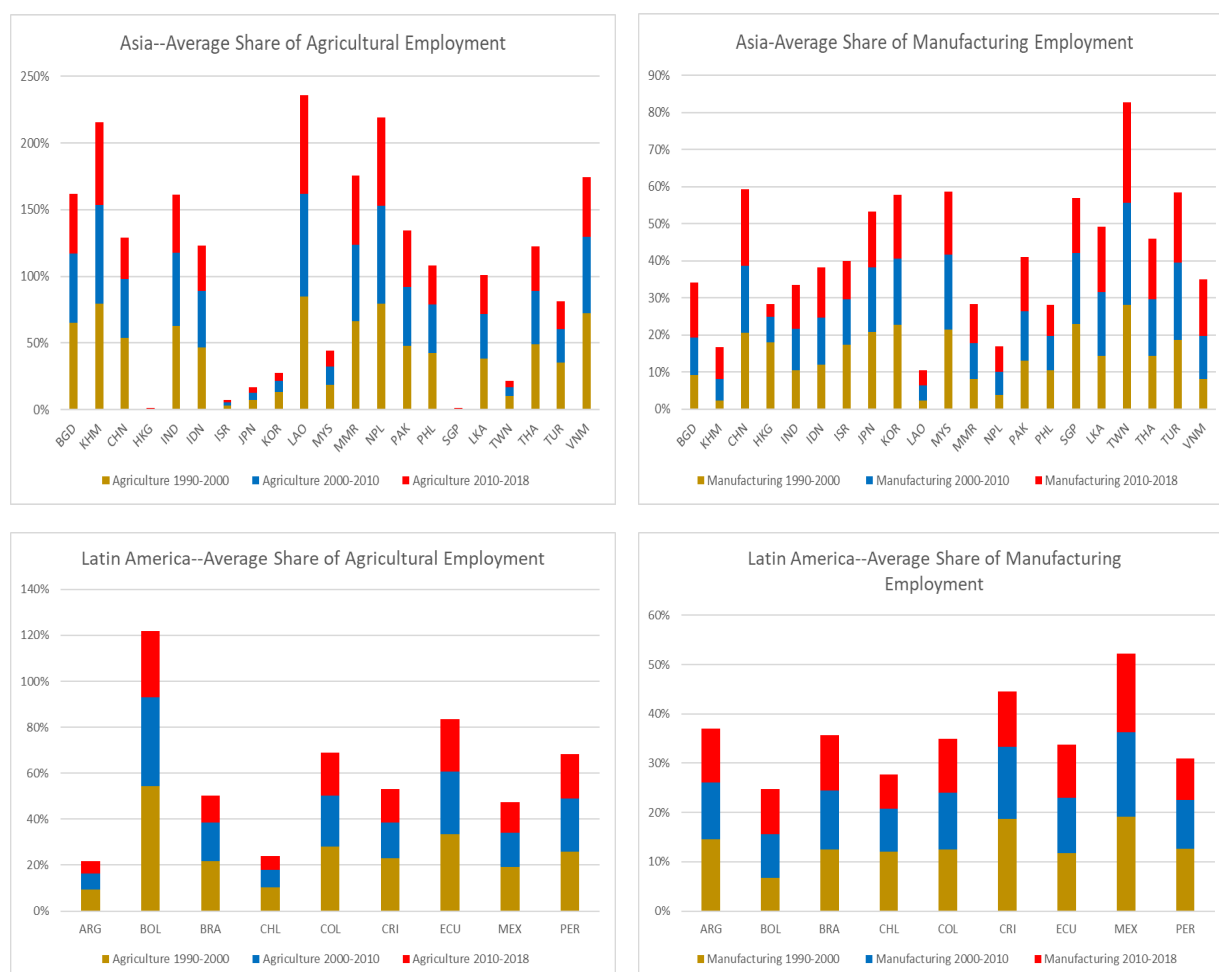
The impressive performance of some African nations, such as Ethiopia, supports our thesis posited over a decade ago (Dinh et al, 2012). We stated that Africa possesses the potential for successful industrialization, provided the correct policies are implemented. Contrary to the laissez-faire policies championed by the 1990s Washington Consensus, or the unsuccessful "inward-looking protection policies" of the 1960s and 1970s, the optimal strategies involve practical industrial policies. These are designed to selectively encourage and foster the growth of labor-intensive, homegrown industries that have potential for regional and global exports.

IV. EVOLUTION OF AFRICAN PRODUCTIVITY IN RECENT DECADES

Productivity is arguably the primary driver of sustained economic growth. In this section, we review the role of productivity growth and its trend in Africa over the past two decades. Currently, there are two distinct methods to study the decomposition of productivity growth: the factor decomposition, and the sectoral breakdown of productivity growth.

Factor decomposition. In a Cobb-Douglas production function, output is linked to factors of production as follows:

$$Y = AK^{\alpha} L^{(1-\alpha)}$$

where Y is output (value added), A is the productivity term, or the efficiency with which inputs are used in the production process, K is the capital stock, L is the labor force, and α is the share of capital share of income.

Taking log and differentiating the above equation yields:

$$\hat{Y} = \alpha\hat{K} + (1-\alpha)\,\hat{L} + \hat{A}$$

where $\hat{Y}$ denotes output growth; $\hat{K}$ and $\hat{L}$ denote growth rates of capital and labor; α and 1-α denote the share of capital and labor in income; and $\hat{A}$ is the growth rate of productivity. This equation shows output growth as a weighted average of capital and labor growth, plus the growth rate of productivity. This last term is commonly referred to as total factor productivity (TFP):

$$\hat{A} = \hat{Y} - \alpha\hat{K} - (1-\alpha)\,\hat{L}$$

This economy-wide productivity term, TFP summarizes everything we do not know about the efficient use of inputs, including technology progress, machinery per worker, institutional arrangements, structural transformation, and so on. The seminal work of Denison (1982), Jorgenson (2005), Solow (1970), and others showed that this term amounts to almost half of total output growth. Both capital and labor are subject to diminishing returns. Hence, long-lasting change in output depends on the growth of productivity.

Recent trends in SSA productivity using factor decomposition. Figure 6 depicts the evolution of SSA's total productivity relative to emerging market and developing economies (EMDE) over the past three decades, as analyzed by Dieppe of the World Bank (Dieppe, 2021). All EMDEs went through a productivity decline caused by factors including the slowdown in working-age population growth, plateauing educational levels, and reduced growth of global value chains.

After the 2008 Global Financial Crisis (GFC), SSA experienced a notable slump in productivity growth, from roughly 2.9% between 2003-2008 to just 0.8% between 2013-2018 (Dieppe, 2021). As it stands, SSA's productivity represents a mere 10% of that of advanced economies. Figure 6 further shows that TFP growth contracted post-GFC, a trend potentially exacerbated by the COVID-19 pandemic. Even more concerning, if the top five productive nations are removed (Equatorial Guinea, Gabon, Mauritius, Seychelles, and South Africa), SSA, alongside South Asia, lags considerably, with productivity levels at around 5% of those in advanced economies.

Figure 9

Factor contributions to productivity growth, 1990s-2018

Percentage points
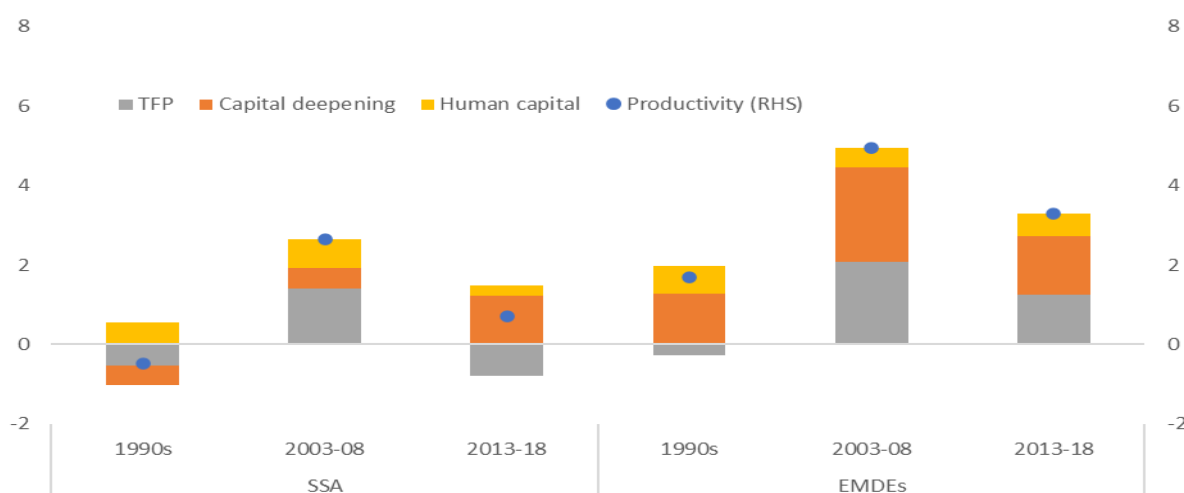
Sources: Figure P5.31.c. Dieppe (2021), Penn World Table; World Bank.

Note: Productivity is defined as real GDP per worker (at 2010 market prices and exchange rates). Country group aggregates for a given year are calculated using constant 2010 U.S. dollar GDP weights. Data for multiyear spans shows simple averages of the annual data. Productivity growth is computed as log changes. The sample includes 30 SSA economies and 93 EMDEs.

Before the GFC, TFP or the efficient use of factor inputs was responsible for over half of SSA's productivity growth (Figure 9). Post-GFC, TFP has declined. The type of commodity a country exports influences this trend, with industrial commodity exporters experiencing sharper TFP decreases than some agricultural commodity exporters. The reduced TFP growth counteracts the productivity gains from capital deepening, observed in countries that have invested significantly in public infrastructure (Dieppe, 2021).

SSA was not unique in this trend. All regions saw a diminished contribution from TFP, with SSA standing out because of its TFP contraction after the GFC, as shown in Figure 10. While the contribution of human capital to productivity growth remained relatively consistent, the influence of capital deepening on productivity growth was less pronounced after the GFC compared to before it. This reduction was especially evident in SSA, as indicated by the contraction of TFP in Figure 9.

Figure 10

Factor contributions to regional productivity growth 2003-2018: MNA, SAR, SSA

Percentage points
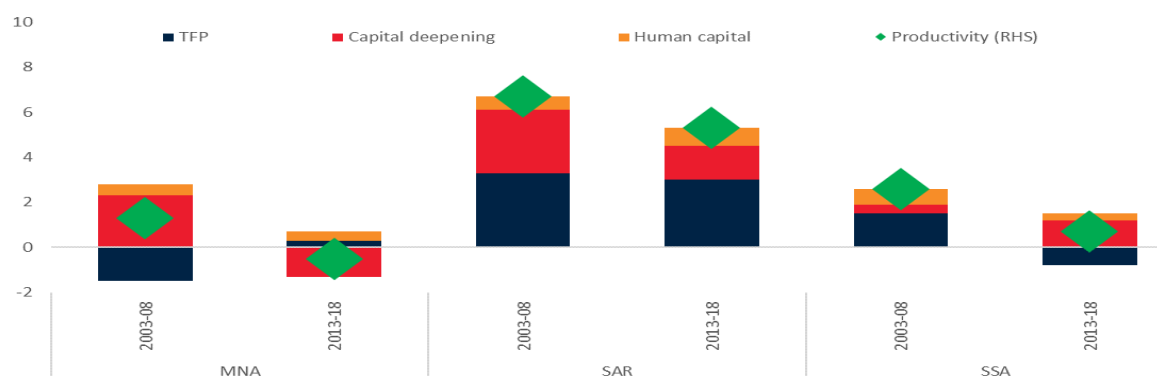
Sources: Figure 1.3F in Dieppe (2021). See also previous figure. The sample includes 10 Middle East and North African countries (MNA), two in South Asia (SAR), and 26 SSA economies.

Sectoral decomposition of productivity. While factor decomposition provides insights into which production factor (capital, labor, or TFP) contributes to output growth, it falls short in revealing inter-sectoral resource shifts. Specifically, it doesn't capture structural transformation—the gains in overall productivity arising from resources moving from low- to high-productivity sectors. This necessitates the use of a multi-sector model with labor productivity defined as the ratio of value-added to employment. Utilizing this labor productivity metric has more implications than mere data convenience. As noted by Baumol et al (1989), labor productivity is a reflection of prospective consumption or living standards. They asserted that this metric captures humanity's efforts to attain the current economic yield, making it an apt measure for gauging an entity's capacity—be it a firm, industry, or an entire economy—to reward its workforce.

Assuming an economy with n output sectors, one can decompose the overall output growth into three components (McMillan et al, 2014; Timmer et al, 2014) as follows:

$$(1) \qquad \Delta Y_t = \sum_{i=1,n} \theta_{i,t-k} \Delta y_{i,t} + \sum_{i=1,n} y_{i,t-k} \Delta \theta_{i,t} + \sum_{i=1,n} \Delta y_{i,t} * \Delta \theta_{i,t}$$

The left-hand side of the equation (1) represents the change in economy-wide labor productivity, defined as GDP divided by employment over the period concerned. The first term on the right-hand side (RHS) measures the 'within effect'—or change in sector productivity due to capital, technology, etc., assuming there is no change in sectoral employment. For example, in the agriculture sector, an improvement in yields because of a new type of seed or an enhancement in irrigation infrastructure would lead to positive change in this within effect, even if there is no change in the labor share in the sector. Conversely, a prolonged war could cause a drop in agricultural output, leading to a negative effect.

The second term on the RHS refers to the static structural change, and reflects the change in productivity brought about by the sectoral gain or loss in employment, assuming there is no change in productivity over the period. As such, it measures the pure effect of the labor movement on overall productivity change. In general, for an economy that grows, this term is positive: there tend to be more jobs created, so the gains would more than offset the losses.

The third term on the RHS is the dynamic structural change. It is a product of the change in sector employment and the change in productivity and therefore indicates the 'right' direction of productivity change. This term is thus positive if the economy progresses along the structural transformation path, that is, resources move from low-productivity to high-productivity sectors. It is negative if the reverse happens; for example, if resources move from high- to low-productivity sectors.

The sum of the second and third term is the structural transformation effect. Some authors refer this as the "between sector" effect, or "structural change" (Diao et al, 2019). In this paper, we use the terms 'structural change' and 'structural transformation' interchangeably. Note that there are two caveats from an ex-ante standpoint. First, labor movement is only possible if jobs are created in the higher-productivity sectors. It is obvious that no structural transformation will take place if there are no jobs in the higher-productivity sectors. Second, sectors with higher productivity may be capital-intensive, leaving little-to-no room for additional job creation because of demand constraints. This is the case with many utility sectors and natural resource-based sectors.

Recent trends in SSA productivity using sectoral decomposition of World Bank data. The sectoral decomposition analysis conducted by Dieppe (2021) for the World Bank revealed that structural change was a dominant contributor to productivity growth in Africa, especially in the 1990s and before the GFC in 2008 (Figure 11). This analysis showed that prior to the GFC, structural change accounted for roughly 73.5% of total productivity growth, a share that declined to about 52% between 2013-2017. This aligns with the findings of Diao et al (2017), who noted that structural transformation was responsible for nearly three-quarters of the productivity growth during 2003-2008. Post-2008, the resource reallocation pace, both inter and intra-sectoral, has decreased.

Figure 11

Within- and structural change contributions to regional productivity growth 1990s-2018
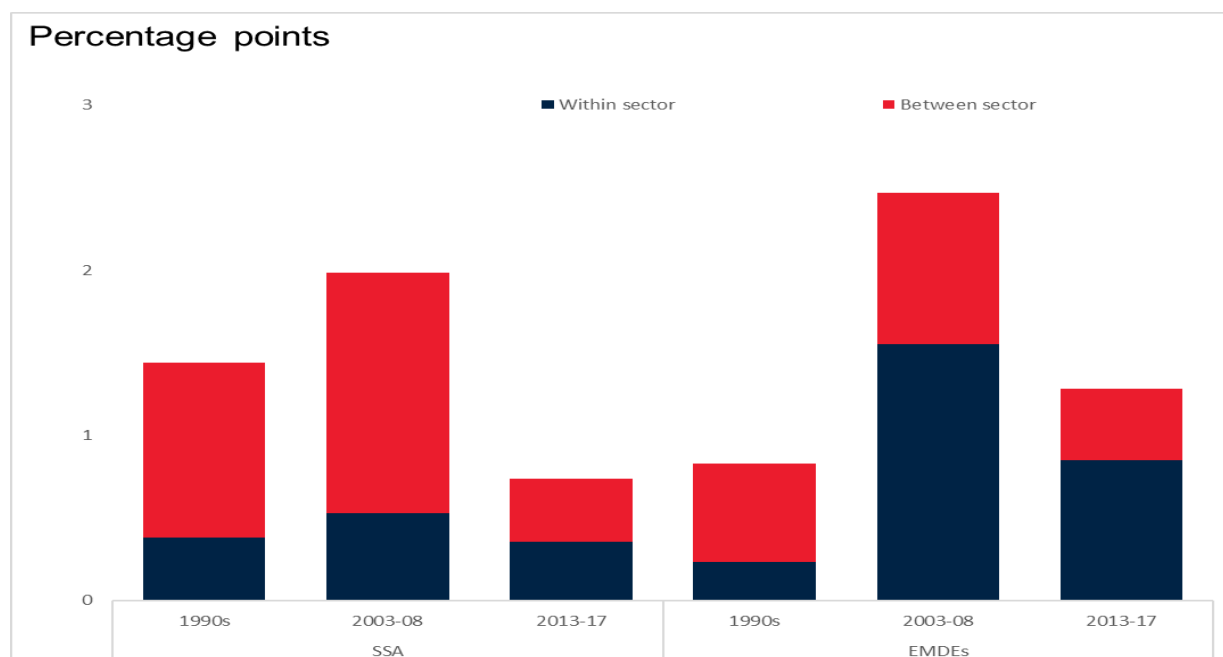
Sources: Figure 5.32.A, Dieppe (2021); APO productivity database; de Vries et al, 2013; Expanded Africa Sector Database; Groningen Growth Development Center database; Haver Analytics; ILOSTAT;

Mensah and Szirmai (2018); Mensah et al (2018); OECD STAN; United Nations; World Bank; World KLEMS.

Note: Structural transformation is the 'between sector' term. Productivity is defined as real GDP per worker (at 2010 market prices and exchange rates). Growth within sector shows the contribution of initial real value added-weighted productivity growth rate of each sector and between sector effect shows the contribution arising from changes in sectoral employment shares. Median of the county-specific contributions. Sample includes 69 EMDEs, of which 22 are SSA economies.

The COVID-19 pandemic may have compounded this trend. Health crises, such as epidemics and pandemics, restrict the mobility of people and ultimately slow geographical and sectoral labor reallocation (Dieppe, 2021). The four channels of productivity growth that were negatively affected by the pandemic include: 1) weaker investment and trade; 2) erosion of human capital and shifts in labor markets; 3) slowing momentum in labor reallocation (reverse migration from urban to rural, for example); and 4) the government entered the pandemic with heavy debt burdens. At recent productivity growth rates, it would take over a century to halve the productivity gap between EMDE and advanced economies. The post-GFC slowdown in productivity growth reflects slower gains in structural transformation, but within-sector productivity has continued. The staggering difference in productivity across sectors means there is significant scope to increase productivity through structural transformation, if there are jobs to be created.

Productivity gains from the structural transformation effect (i.e., the reallocation of labor between sectors) slowed down in five regions defined by the World Bank: Europe and Central Asia (ECA), Latin America and Caribbean (LAC), Middle East and North Africa (MNA), South Asia (SAR) and Sub-Saharan Africa (SSA) during the post-GFC period (Figure 12). LAC and SSA were particularly affected. Within-sector productivity enhancements also slowed. Only one region, East Asia and the Pacific (EAP), achieved within-sector productivity gains during the post-GFC period.

Figure 12

Within- and structural transformation contributions to productivity growth by regions (1990s-2017)
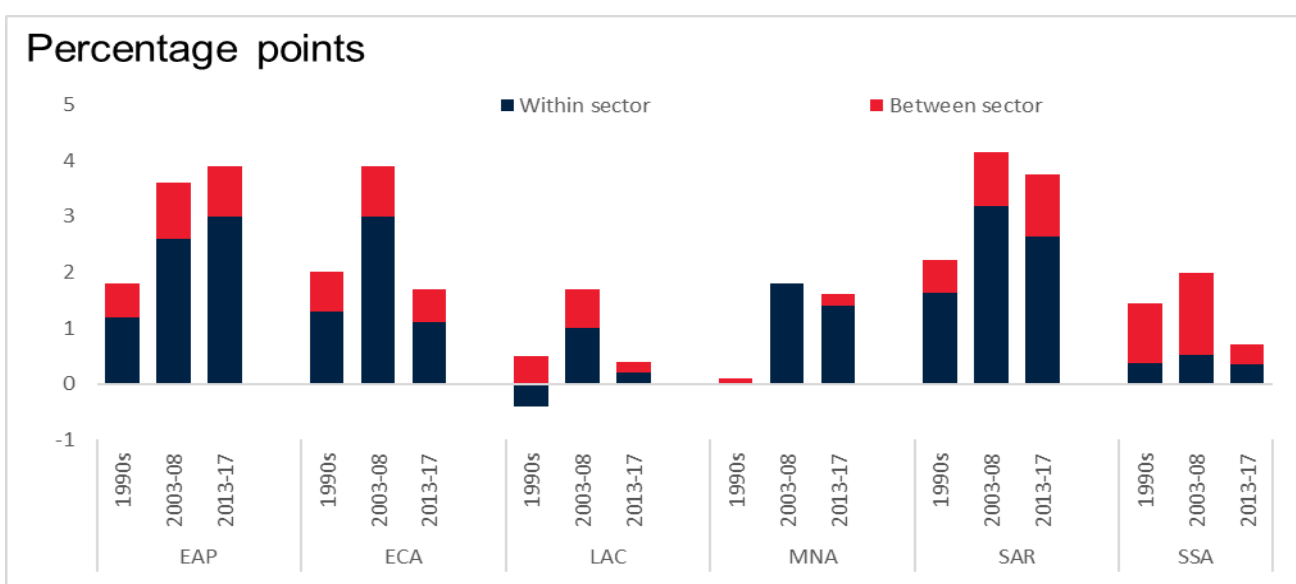
Sources: Figure 7.3B Dieppe (2021); Table APO; EASD; GGDC; ILO; KLEMS; national sources; OECD; United Nations; World Bank. Notes: Based on samples of 94 countries for 1995-1999 and 103 countries for 2003-2017. Median of the country-specific productivity. Growth within sector shows the contribution of initial real

value-added weighted productivity growth rate and between sector growth effect give the contribution arising from changes in the change in employment share. Median of the country-specific contributions. 'Other industry' includes mining, utilities, and construction; 'Finance' includes business services; 'Other service' includes government and personal services.

Dieppe noted that low agricultural productivity in SSA reflects the prevalence of subsistence farming, suboptimal crop selection, poor land quality amid unfavorable climates, limited uptake of modern technologies and production methods to improve yields, and small farm sizes.

There are large productivity gaps across the sectors and also across countries within each of the sectors. In SSA, productivity in agriculture is lowest, amounting to between 3%-5% of the level in the the most-productive sectors (mining and finance) and about three times lower than average agricultural productivity in EMDE. Looking ahead, further sectoral reallocation continues to have the potential to boost productivity growth in SSA, where low-productivity agriculture accounts for about 50% of employment but less than 20% of output. Substantial gaps in productivity offer the potential for further aggregate productivity gains from resource reallocation between sectors.

Progress in Africa Structural Transformation During the Last Three Decades Using Economic Transformation Database

A detailed decomposition of productivity growth by sector for 21 SSA countries over a 28-year period, from 1990 to 2018, was conducted for this paper. Our analysis confirmed previous findings of a slowdown in total productivity growth in SSA countries between the 2000-2010 and the 2010-2018 periods. Twelve out of 18 countries showed a decline over this period. The unweighted average annual growth in total productivity for the 18 SSA countries dropped from 2.8% to 2.3%. Over this period, the average growth rate of the structural transformation effect (defined as the sum of the last two components on the right-hand side of equation 1) declined from 1.55% to 1.31%. Figure 13 presents SSA countries' progress on structural transformation.

Figure 13
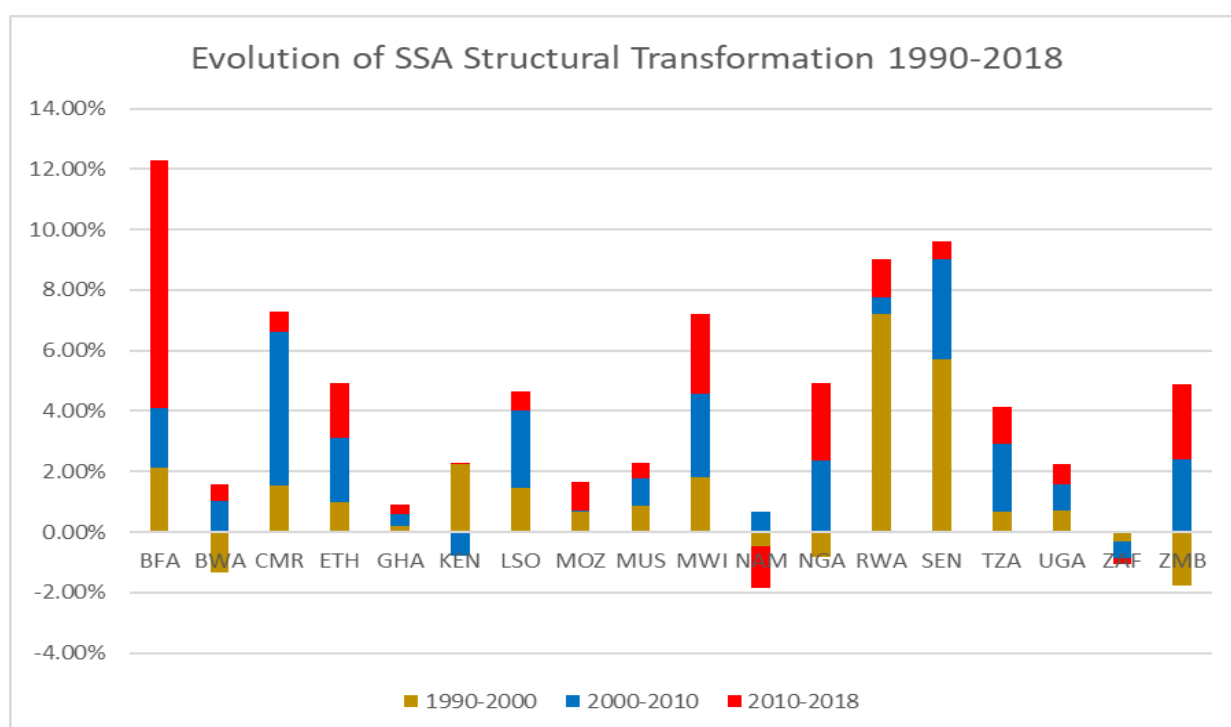
Evolution of SSA Structural Transformation 1990-2018

The most successful countries in terms of structural transformation over the last three decades were Burkina Faso, Namibia, Tanzania, Ethiopia, Malawi, and Ghana, while the top five over the decade prior to the COVID-19 pandemic were Burkina Faso, Malawi, Nigeria, Zimbabwe, and Ethiopia. For comparison purposes, Figure 14 shows the evolution of the same effect for Asian and Latin American countries.

Figure 14
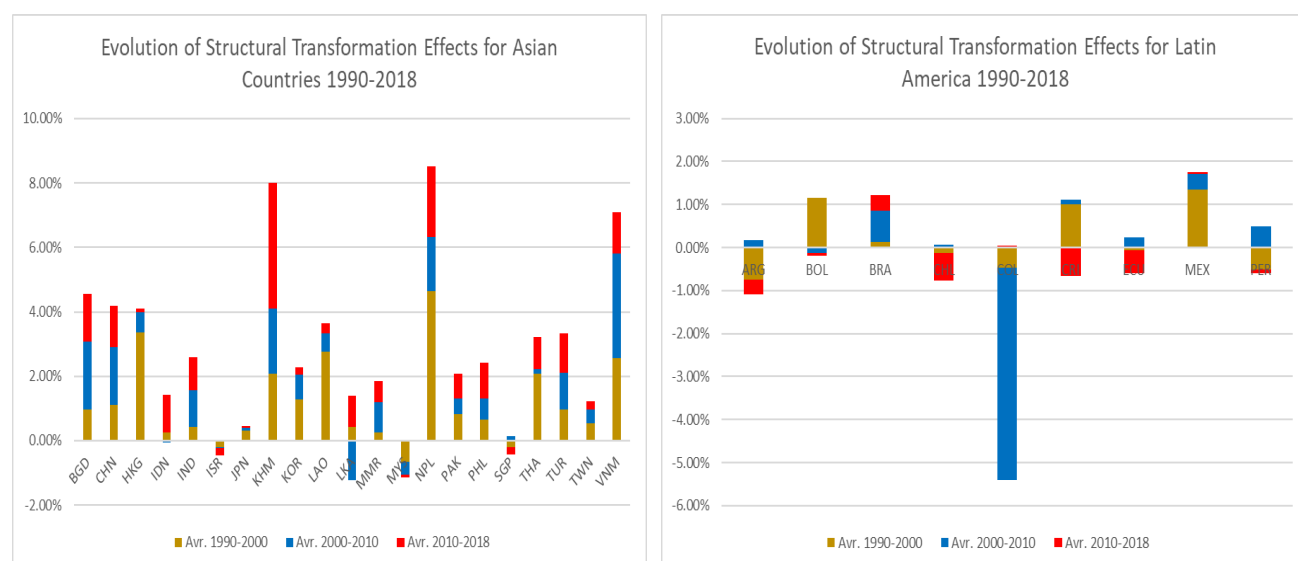
Our study provides a more nuanced view than previous works on the evolution of the structural change. It's crucial to distinguish between the structural change itself and its percentage contribution to total productivity growth. This finding slightly changes the conclusions made by Dieppe (2021) about the productivity decline post-GFC, and the contribution of the 'between' effect to total growth. More specifically, structural change declined from about 1.55% in the 2000s to 1.31% in the 2010s, but its contribution to total productivity growth rose slightly from 56% to 58% (because overall productivity growth declined from 2.77% to 2.25% over this period).

At the country level, our research corroborates the finding that 11 out of the 18 countries sampled experienced a drop in the contribution of structural transformation to total productivity between the studied periods (Table 4). However, we did not find support for the concerns voiced by Diao et al (2019) that SSA countries may have to choose between increasing labor productivity or increasing employment, because the negative 'within' effect offsets the positive 'between' effect on overall productivity growth, unlike the East Asian countries where both effects reinforce each other. We will return to this point in the next section.

Table 4

	Total Productivity Growth 2018-2010	Share of Structural Transformation in Total Productivity Growth		
		1990-2000	**2000-2010**	**2010-2018**
Ethiopia	5.93%	319%	46%	30%
Tanzania	4.64%	23%	98%	26%
Malawi	4.07%	214%	214%	65%
Rwanda	3.59%	195%	11%	35%
Burkina Faso	3.51%	113%	49%	233%
Mozambique	3.09%	33%	0%	31%
Ghana	3.00%	7%	17%	11%
Kenya	2.85%	-77%	114%	1%
Cameroon	2.71%	-84%	1850%	24%
Lesotho	2.17%	29%	97%	29%
Mauritius	2.04%	21%	24%	25%
Botswana	0.86%	-46%	68%	62%
Uganda	0.77%	20%	22%	91%
Zambia	0.55%	-100%	49%	460%
Namibia	0.41%	-17%	46%	-334%
Senegal	0.30%	823%	360%	200%
South Africa	0.18%	98%	-21%	-95%
Nigeria	-0.15%	4140%	52%	-1668%

Source: Author's calculations from the Economic Transformation Database, 2021 (de Vries et al, 2021). Period average is simple average growth rates because growth rates are calculated from the logarithmic regression line.

Structural Change and Job Creation

The potential for structural transformation is more significant when there are substantial productivity gaps across sectors. For primarily agrarian low-income countries, the fastest route to transformation is to generate jobs in manufacturing, where productivity is higher than in agriculture. Alternatively, the services sector could be an engine of growth instead of manufacturing. The choice between manufacturing or services depends on a country's resource endowment. However, some drawbacks of services compared to manufacturing include: (i) most services in low-income countries are not tradable, whereas manufactured goods are and can earn foreign exchange; (ii) tradable

services demand skills that are often scarce in developing countries; and (iii) the externalities involved in manufacturing production and its backward and forward linkages in an economy make this sector an attractive choice. Barring a few city-states, all now-developed countries transitioned from agrarian economies to manufacturing and then to services.

Effective and lasting economic growth demands both intra-sectoral productivity enhancements and structural change. The factor decomposition approach presented in this section allows us to look at what causes the intra-sectoral productivity enhancement, while the sectoral decomposition helps us review the inter-sectoral productivity (structural) change. Both approaches are useful to understand productivity change over time. For instance, agricultural mechanization can lead to higher yields per farmer but, over time, can result in fewer farmers generating the same or increased output. These surplus agricultural workers must then find employment in other sectors. If these sectors are more productive than agriculture, then structural transformation occurs. However, if no such opportunities are available, the economic impact of mechanization remains limited.

Whether other non-agricultural sectors can absorb these workers depends whether the economy can expand. This in turn depends on both demand and supply factors in the economy. In developing countries with extensive unemployment or underemployment, the supply-side requirement can be satisfied, at least for unskilled or semi-skilled workers. Employment of the surplus workers then depends on whether there is sufficient aggregate demand to expand output. This underscores the historical importance of manufacturing as a developmental linchpin: its tradable nature allows external demand to drive growth and employment. While some service sectors can fulfill this role, they often demand higher skills than typical manufacturing jobs.

Finally, two unique features of SSA countries influence their productivity growth: a lack of diversification, and the dominance of informal economic activities. Commodity exports now represent over 20% of SSA countries' total exports. Widespread subsistence agriculture in SSA countries holds back productivity in their large agricultural sectors. Economies that are highly reliant on a narrow range of commodity exports can also suffer from misallocation and procyclical trends for productivity growth. In EMDE regions, informal sectors make up 22%-40% of official GDP, but a larger employment percentage (22%-62%), indicating productivity disparities. Informal firms, being less productive than formal ones, can discourage investment and weaken the productivity of formal businesses.

V.   NEW EMPIRICAL EVIDENCE ON AFRICA'S INDUSTRIALIZATION AND INDUSTRIAL POLICY

Diao et al (2019) analyzed the pattern of rapid economic growth experienced by a group of African countries and found that this pattern differed from that of East Asia. Growth was largely driven by structural change, while the 'within' component of labor productivity growth in the modern, non-agricultural sectors was negative. In the East Asian growth experience, both components contributed strongly to productivity growth. Diao et al (2019) expressed concerns that if this pattern persists, future growth for Africa may not be sustainable because the productivity gap between agriculture and other sectors—which gives rise to the structural change—could be depleted before comprehensive industrialization is reached, a phenomenon termed "premature structural transformation."

Diao et al (2019) developed a model to show that the African experience is consistent with growth driven by aggregate demand shocks or by improvement in productivity growth. Without consistent intra-sectoral productivity gains, the increase in demand would likely be satisfied by expanding the less-efficient informal firms, causing modern-sector productivity to decrease. This contrasts with the supply-side model in which a rise in the modern sectors' productivity (caused by technology for instance) expands their output as it draws labor from agriculture, which was the case in East Asian countries.

Their interesting model raises a number of practical issues. First, as the authors pointed out, the scope for structural transformation is still very significant for Africa, given the large disparity among sectoral productivity levels. Thus, agriculture productivity represented only 35% of average productivity, while manufacturing productivity was 1.7 times as high. African countries therefore still need to rely on structural transformation as a driver of growth. Second, their call for increasing productivity in the non-agricultural, modern sectors does not imply that agricultural productivity should be neglected. As they pointed out, agriculture can be a driver of growth-inducing structural change. Third, skill requirements impose a limit on how many workers can be employed in the modern sectors. Policymakers, therefore, are still faced with finding productive jobs for a large pool of unskilled or semi-skilled workers currently in the informal sectors, or in micro, small, and medium-sized enterprises (MSMEs). Finally, the key issue is if, and how many, jobs can be created in the higher-productivity sectors so that the surplus labor released from the agricultural sector can be absorbed. Of all sectors, manufacturing is ideal as it's widely tradable and can expand without productivity changes. Other high-productivity sectors—such as banking which requires advanced skills—cannot expand in isolation and need the non-tradable sectors to keep up. Thus, the supply of non-tradable goods may act as a brake on supply expansion.

The findings of Diao et al (2019) need to be reconciled with Timmer (2012), who argued that the less productivity rises in industry and services, the more rapidly structural transformation can occur. The quickest path to structural transformation is when productivity in industry and services is constant, such as in assembly work. For the productivity level to be constant, the 'within' component has to increase to offset the decline in marginal productivity of labor as more labor is drawn into the sector. But if the 'within' component increases too quickly, then fewer jobs will be created if output cannot expand. Timmer's emphasis on structural change applies to the low-income countries at the beginning of the industrialization process, while the emphasis in Diao et al (2019) on 'within' sector productivity growth applies to lower-middle income countries that have already embarked on industrialization and have joined global value chains (GVCs).

This explains why at their current development stage, low-income SSA countries need simple, labor-intensive jobs, such as the large-scale assembly jobs that FDI and GVCs brought to Bangladesh, Cambodia, and Vietnam in the 1990s. The goal is to create as many jobs as possible to fully utilize the country's resources and generate externalities through learning by doing, rather to deepen the value addition. In other words, low-income countries need to expand their industries horizontally, as opposed to moving up the value-added scale, as during vertical expansion. In creating tradable services jobs through horizontal expansion, the presence of marginal workers will be less likely to lower average productivity—ultimately facilitating the absorption rate of surplus labor. This horizontal expansion is consistent with the task-based nature of modern manufacturing and the acute need for job creation, a need that has been made more urgent by demographic forces. Vertical expansion—moving up the value-added chain through skills enhancement and so on—can only be achieved at a later stage in middle-income countries.

In a subsequent paper and using more recent data, Diao et al (2021) argued that Africa's industrialization problem lies in the inability of large firms—which have high productivity growth—to generate employment, while the small, informal firms that create the bulk of employment do not have high productivity. This confirms a point made by Dinh et al (2012) that there was a near absence of large firms in Africa and there existed a very large number of small, low-productivity, mostly informal, firms that catered to the low-end of the domestic market. One explanation for this phenomenon may relate to the skills required to organize and manage medium and large firms. The capabilities of small entrepreneurs are insufficient for graduating from the typical small enterprise into the highly skilled workforce of mid-size manufacturers, where in-depth industry knowledge and experience in managing a certain scale of operations is required (Sutton and Kellow, 2010). Another explanation could be the absence of government policies, like those applied in Asian

countries to facilitate the process necessary for small entrepreneurs to evolve into medium and larger firms. Diao et al (2021) suggested that this problem is related to the use of capital-intensive techniques associated with global trends in technology.

McMillan and Zeufack (2022) provided a comprehensive review of African industrialization. They found that manufacturing employment in Africa has grown rapidly in the last two decades, but this growth has been concentrated in the small firms where productivity growth has been low compared to large firms. The slow rate of employment growth in large firms, in turn, was due to the relative capital intensity of African manufacturing, which is mainly in the processing of natural resources, and in part due to the trend of rising capital intensity in manufacturing itself.

McMillian and Zeufack (2022) showed that in Africa, the aggregate gain in labor productivity in the manufacturing sector comes from structural transformation, and not much comes from within the sector itself. Indeed, the positive effect from this structural transformation was partly offset by the negative gain in productivity coming from within the sector, unlike the countries in Asia, where the two effects reinforced each other. McMillian and Zeufack (2022) showed that employment growth in African manufacturing tends to be dominated by the small and less-productive firms, whereas in Asian countries this growth is dominated by the larger formal sector. Therefore, if African countries want to industrialize, it is imperative that they expand manufacturing, exports, and employment in the formal sectors.

Rising manufacturing capital intensity has been a focal concern in policy discussions. One potential reason is the higher labor costs in SSA relative to similar income countries (Gelb et al, 2020). Hallward-Driemeier and Nayyar (2017) questioned manufacturing's future as a growth engine due to technological advancements favoring specialized labor. However, they acknowledged that certain manufacturing sub-sectors—such as the garment industry—remain suitable for low-income nations.

While it is true that manufacturing technologies (which mostly come from developed countries) have increasingly become capital-intensive and employ fewer unskilled workers in favor of a highly skilled work force, SSA countries will have no choice but to navigate these challenges. On the one hand, they have to find jobs for millions of young workers who enter the work force each year. On the other hand, it will take them many years to train workers suitable for the new manufacturing technologies. The next section will discuss these challenges and the options for African countries.

Meanwhile, new theoretical and empirical work has emerged pointing to evidence supporting the success of industrial policy. 'Industrial policy' here is broadly defined as policies undertaken to change the structure of an economy. Juhász et al (2023) summarized the new findings accumulated from recent research, revealing a generally more positive assessment of industrial policy. Contrary to popular belief, industrial policy has been ubiquitous throughout the world. In fact, in the developed economies, a substantial share of GDP is destined toward industrial policy each year. Furthermore, industrial policy and outward-oriented development policy could go hand-in-hand—hence the difference between 'modern' industrial policy and the inward oriented protectionist policies of the 1960s and 1970s. Using modern statistical techniques, Juhász et al (2022) showed (among other things) that industrial policy is more common and has expanded since 2010, and that countries often use subsidies and export-promotion measures targeted at individual firms and/or a subset of industries with a comparative advantage. They also found that industrial policy is relatively rare among the poorest nations.

These findings lend credence to the increasingly popular use of industrial policy by developed countries in recent years—from the green transition to supply-chain support. We see such policies in action with the Inflation Reduction Act and the CHIPS and Science Act in the U.S., and the 2023 Green Deal Industrial Plan in the European Union. Juhász et al (2023) also showed that the East Asian experience offers useful insights into the effective practice of industrial policy. While their findings are about industrial policy in general and not for any specific region such as Africa, they have many important implications for Africa's

industrialization. Their stance on intense collaboration between government and private firms—what they call "embedded autonomy"—and the suggestion of using a broader range of supporting industrial policies were also documented by Dinh (2017), who provided a detailed account of the practice of industrial policy by Chinese local authorities. Finally, Juhász et al (2023) also suggest modifications in the practice of industrial policy to take modern technology into account, a subject we discuss in the next section.

VI.   WHAT SHOULD SSA COUNTRIES DO?

The research presented above indicates clearly that adopting a traditional industrialization approach will not be enough to generate jobs for the millions of young Africans joining the workforce each year, or to address the productivity dilemma. Emerging technologies will reduce reliance on unskilled and semi-skilled labor and will increasingly demand skilled workers. Consequently, Africa must invest in equipping its workforce for these technological advancements. It is crucial for government leaders to personally take on the task of initiating and facilitating the entry of FDI into their countries, and to ensure there are no impediments to their operations.

However, solely focusing on high-productivity, FDI-driven, GVC enterprises will not adequately alleviate unemployment—especially among the unskilled labor force. Traditional economic sectors remain pivotal for absorbing unskilled and semi-skilled workers, and it is essential that governments promote their growth and integrate them into the economy.

To address these challenges, African countries should implement a balanced and adaptable strategy encompassing diverse enterprise types. This entails formulating policies that foster FDI for deeper immersion into global value chains (GVCs), stimulating the growth of indigenous firms catering to regional and domestic markets, and actively championing digitalization to connect the two sectors. Policies should be rooted in practicality, bolstered by empirical case studies demonstrating successes and failures in specific scenarios. Some of these policy insights are discussed in the next section.

A pertinent issue for African industrialization is the rising capital intensity of manufacturing. Research indicates that countries such as Ethiopia and Tanzania have high capital-to-labor ratios when juxtaposed with other nations. For instance, Diao et al (2021) discovered that the capital labor ratio in Ethiopia's garment subsector is quadruple the nation's average capital intensity. Contrarily, in Vietnam, the ratio remains basically the same. It is not clear why this disparity exists, given that firms in Ethiopia's garment sector use equipment from China, where technologies should, in theory, favor labor-intensive production methods. Gelb et al (2020) highlighted that labor expenses in SSA countries are notably higher than in countries at the same income level. The implication is that higher labor costs may prompt multinational GVC enterprises to adopt more capital-focused technologies in their SSA investments.

Various policy solutions are available to mitigate this challenge. Some Latin American nations have established specialized industrial zones with special wage regulations. Alternatively, the relatively high labor costs in Africa could be offset by leveraging other accessible inputs, such as industrial land equipped with essential infrastructure (e.g., electricity, water, transport). Practical, second-best solutions might be preferable here. Our research on African manufacturing revealed many instances where activity clusters (e.g., cut flowers in Kenya and Ethiopia, tomatoes in Senegal) flourished despite sectoral constraints.

As McMillian and Zeufack (2022) highlighted, certain manufacturing sub-sectors remain labor-intensive, like the garment industry, showcasing the vast potential for Africa if strategic initiatives are implemented. They also conducted a comparative analysis of Tanzanian and Ethiopian exports

and noted that the former's export volume and growth were twice as much as the latter, despite Ethiopia's success in integrating its production and exports into the global value chain. McMillian and Zeufack (2022) attributed this difference to the nature of Tanzania's exports, most of which are based on agro-processed and materials-intensive products. The former includes goods like bottled juices and cooking oils, while the latter includes wood products and household furniture and various household items. Hence, there is great potential to export these goods within Africa.

It should be noted that while the direct employment effects in resource-based manufacturing goods may be limited because of the high capital intensity, the indirect benefits associated with these exports could be significant. Agro-processing has the potential to create jobs and wealth indirectly for logistics and packaging companies, restaurants and hotels, agricultural input suppliers, and so on. McMillian and Zeufack (2022) noted that even among informal-sector firms, a small subgroup—known as 'in-between' firms—does have very high productivity growth. One way to encourage these forms of growth is to identify and encourage startups with growth potential. The recently inaugurated African Continental Free Trade Area, established in 2021, offers a prime opportunity for SSA countries to expand their market reach.

Some critics have raised objections to the approach of 'picking the winners' because Africa's experience has not been successful. But the limited resources of African countries require targeted policies to support private investment and create jobs. Moreover, successful industrialization cases did not actually involve picking winners—they combined the role of governments with market forces, rather than relying on governments only (Dinh et al, 2013b, 464-489). Government support for manufacturing enterprises varies according to phases of the business life cycle. While this support has been wide-ranging—including fiscal incentives, infrastructure development, and advisory support on upgrading—assistance has not always involved spending money.

As Dinh (2017) noted, industrial policy as it was actually carried out in China has not been a singular prescriptive policy applied in all districts and provinces. Instead, various policy approaches have been adopted depending on the local context and the particular stage of development. For example, the government does not promote SMEs at the expense of large enterprises. The SMEs provide jobs, while the large enterprises provide subcontracting work for the SMEs. Similarly, the government does not support new firms, except through the provision of land and factory shells, but once a firm is established and is doing well, the government is available to offer many services. This might include streamlined administrative procedures, support for technological upgrading, and access to market information through networking. The goal is to guide the firm and the industry to become nationally competitive. The government has thus played a critical role in facilitating the creation of input and output markets around which industrial value chains and clusters have evolved.

The green manufacturing sector presents another potential avenue for African industrialization, especially considering Africa's unmatched solar energy capacity. Transitioning to green manufacturing could enhance cost-competitiveness in light manufacturing, promoting job growth. The pharmaceutical industry is another viable sector, offering both health and industrialization benefits.

In conclusion, SSA countries should harness the insights discussed above and proactively champion industrialization. This approach should be anchored in:

- Recognizing that market forces alone won't generate industrialization.
- Understanding that no 'one-size-fits-all' policy exists, and individualized strategies are required.
- Ensuring that policies are practical, flexible, and focused on real-world challenges, rather than rigid ideologies.
- Fostering close collaboration between the public and private sectors to facilitate effective industrialization initiatives.

VII. TOWARD A NEW INDUSTRIALIZATION DRIVE

To propel industrialization, SSA countries should adopt flexible strategies to foster structural transformation and boost productivity in both large and small enterprises. Policies should focus on encouraging foreign investment, nurturing local enterprises, and promoting digitalization. Such policies should be grounded in practical insights and should foster strong public-private collaborations (Dinh et al, 2012).

The recommended industrialization policies can be broadly divided into two groups: general policies to facilitate structural transformation, and specific policies to foster manufacturing.

General policies to facilitate structural transformation. The following policies are cross-sectoral, as described below:

- **Creating a Supportive Environment:** Uphold political and macroeconomic stability and commit to advancing manufacturing and bolstering the private sector as primary governmental goals. Ethiopia, with the second-largest population in Africa, made commendable industrial progress in the early 2010s. However, issues related to the U.S. market access through the African Growth and Opportunity Act (ALGOA), rooted in political challenges, hindered further growth in Ethiopia.

- **Elevating Agricultural Productivity:** Introduce measures like land-tenure security, enhanced market and financial access, informed crop selection, efficient fertilizer usage, and irrigation system upgrades to transfer surplus labor to more productive sectors.

- **Maximizing Informal Sector Potential:** Upgrade worker skills, enhance access to financial services, ensure efficient transport and communication, offer healthcare, and solidify land and property rights. Furthermore, simplify the transition to the formal sector by minimizing registration costs.

- **Minimizing Mobility Obstacles:** Prioritize investments in vital infrastructure—i.e., transport networks, energy sources, and communication systems. Consider worker housing near industrial zones and simplify the relocation of administrative processes, such as school enrollment.

Specific Policies to Bolster Manufacturing:

- **Cultivating Foreign Direct Investment (FDI):** National and local leaders should actively encourage and entice FDI in manufacturing, while addressing barriers that stifle FDI growth. Collaborative endeavors between FDI enterprises and vocational institutions can offer essential workforce training. The East Asian experience shows that the value of FDI extends beyond job generation, encompassing knowledge transfer and financial integration.

- **Stimulating Local Economic Ventures:** It is crucial to recognize and support indigenous economic initiatives. Past studies on Africa and Asia offer insights into effective manufacturing growth strategies—such as strategic sequencing, starting small, upscaling or downsizing as necessary, and pinpointing success zones through targeted policies (Dinh et al, 2013).

- **Bridging Small and Large Enterprises:** Drawing from the East Asian model, SSA nations can employ policies that bridge the gap between the small firms and the large FDI or GVC-related enterprises. This can involve offering equal incentives to both direct and indirect exporters, and fostering organic clusters, which are groups of enterprises and institutions that share a specific kind of business activity in a limited geographical area.

Advancing Digitalization for Industrial Growth: The evident discrepancy between output and employment across small and large enterprises in SSA presents an important opportunity for digitalization. Strategic digital integration can elevate the standing of MSMEs, enhance the technology capabilities of major enterprises within global value chains, and foster mutual cooperation between the two entities.

Details on Specific Policies to Promote Manufacturing

Cultivating Foreign Direct Investment (FDI). The primary responsibility for promoting and attracting FDI in manufacturing within a country lies with that country's national and local leaders. Obstacles that inhibit the growth of FDI enterprises should be addressed and removed. Policymakers must collaborate with these enterprises and vocational/technical training institutions to offer comprehensive training for the workforce. It is crucial to understand that the goal of FDI is not merely job creation, as shown by the successes of East Asian countries; FDI also aims to bridge knowledge and financial gaps.

For African countries, the absence of financial resources for investment is just one challenge. Equally pressing is the dearth of expertise, technology, and innovation. Both FDI and networks are essential to bridge this gap. FDI can address shortfalls in education, management, entrepreneurial skills, technical expertise, commercial knowledge, and market insights, allowing entrepreneurs to thrive even without formal education. Social networks can replace market institutions where they're lacking.

Our previous research on manufacturing in Africa (Dinh et al, 2013b) revealed that in almost all successful case studies, FDI was fundamental—not so much for domestic start-ups but for the growth and technological advancement of these start-ups. The garment industry in Bangladesh serves as a clear example of how FDI can complement a country's domestic resources to foster more productive employment. A local company, Desh, provided land and labor, while the Korean firm Daewoo offered training and machinery, thereby addressing the binding constraints in the sector. What is striking in the Bangladesh case is the spillover: of 130 Bangladeshis sent to Korea for training, 115 had set up their own shops back in Bangladesh within seven years, and thus began to contribute to the growth of their country's garment sector (Crook, 1992).

The Mauritian textile and apparel industry underscores the significance of entrepreneurship. While early waves of FDI boosted the industry, it was the subsequent skill transfer that energized domestic entrepreneurs. In both Bangladesh and Vietnam, foreign investment introduced novel ideas and methods. This is also evident in sectors such as cut flowers in Ethiopia and tomatoes in Senegal, where international investors brought in technical knowledge and managerial expertise. In Kenya, the marriage of domestic industry with international entrepreneurship led to significant job creation, increased exports, and considerable revenue.

Given the strong link between FDI and global value chains, it's vital for SSA countries to actively court as much FDI as feasible. Patience will be a determining factor in this endeavor.

Growing Local Economic Activities. However, relying solely on FDI won't sufficiently address the employment needs of African countries. Emphasis must also be placed on nurturing and expanding local, indigenous economic activities. Our case studies reveal certain strategies that were instrumental in East Asia's manufacturing development, including: a) using substitution policies and sequencing; b) starting small; and c) encouraging organic clusters.

a) Using Substitution Policies and Sequencing. Addressing binding constraints in manufacturing can be achieved through innovative policy solutions. Bonded warehouses, for example, can offset difficulties surrounding the availability of inputs and logistics, while associations of businesses can fulfill some of the functions of trading companies. Similarly, the innovative back-to-back letter-of-credit system used by garment exporters in Bangladesh was developed to ease the constraints in foreign exchange and access to finance, while the Sialkot sporting goods cluster in Pakistan formed the Sialkot Dry Port Trust to overcome the constraint in trade logistics (Dinh et al, 2013b).

One especially effective policy for alleviating most manufacturing constraints is the establishment of industrial zones. While they often are not the primary recommendation for industrialization in African countries, due to being considered second-best solutions, their impact can be substantial. For instance, industrial parks offer centralized electricity and transportation services. Though these solutions may deviate from ideal efficiency, they can significantly accelerate industrialization in resource-limited settings. The rationale for such solutions draws from Schumpeter's insights on dynamic versus static efficiency. The influential work of Rodrik (2004) has shown that first order economic principles can be applied in a flexible way to take account of local opportunities and constraints.

<u>Sequencing the Domestic Market Before Export Market.</u> The domestic market in most African countries is relatively small. Hence, many economists have suggested focusing on the export market. However, in manufacturing, starting small and simple is more effective. Jumping directly to the export market might not be feasible without first addressing the binding constraints in each subsector. Encouraging domestic production of currently imported simple manufactured goods, for which there is existing demand, could be a strategic starting point.

<u>Sequencing Final Goods Before Intermediate Goods</u>. In many low-income countries, the initial phase of industrialization sees the production of final goods (assembly line) due to their labor-intensity and minimal skill requirements. As firms establish themselves in the final goods market, the focus can transition to intermediate goods, which are more capital and skill-intensive. Over time, with increasing productivity and technological advancements, there is potential for more complex intermediate goods production. Starting with final goods production offers employment to large numbers of low-skilled workers. Capital and skill-intensive investments can come later, or in parallel via FDI.

b) Starting Small and Building Up or Cutting Back. Case studies around the world show the efficacy of starting small in low-income countries. For instance, East Asia's light manufacturing development began with assembling simple products in home workshops. Over time, this has led to larger, more sophisticated businesses competing globally. Ethiopia's cut flower industry, which started on just seven hectares in 2000, grew substantially due to starting small, proving the potential of this method. In contrast, Tanzania's attempt at building Africa's largest shoe factory in Morogoro, without prior evidence of private-sector success, ended in failure. This reinforces the idea that starting small allows for learning, adaptation, and strategic location selection. If a policy or project is not working, it is vital to stop and reassess to avoid unnecessary resource drain. Mistakes are a natural part of the growth process.

c) Encouraging Organic Clusters. Another way to help MSMEs grow—rather than merely establishing them, as most African countries have done until now—is to encourage clusters. An industrial cluster usually features a group of enterprises and institutions that share a specific kind of business activity in a limited geographical area. Industrial clusters are common in developing countries among MSMEs producing similar or related products. Examples include shoe, garment, furniture, woodworking, and metalwork clusters.

Clusters offer many advantages. Clustering contributes to industrial development by mitigating market failures, including the lack of market and technology information, information asymmetry, moral hazards, and imperfect contract enforcement. Because of their geographic proximity, firms can trade intermediate goods and services with other firms in the cluster more easily, resulting in lower transaction and monitoring costs. Moreover, effective information and technology exchange is facilitated, enabling enterprises to learn from each other (known as information spillovers). Clusters foster the emergence of labor markets for specialized skills, making it easier to find workers with the required skills. Clusters can likewise help attract customers, suppliers, and traders.

Empirical studies have shown that industries participating in successful clusters report higher employment and wage growth, and more manufacturing establishments and patents. Healthy cluster environments are often also associated with more new industries. Once a few firms in an industry form a cluster in a local community, the entry costs for other firms decrease due to positive external economies. The development of effective transfers of information and technology within clusters creates opportunities for the emergence of other industries and clusters.

Linking Small and Large Enterprises. To connect small enterprises, which create jobs but often have low productivity, with larger FDI or GVC-related enterprises, SSA countries should offer equal treatment to both direct and indirect exporters. In the past, East Asian economies, such as Japan and Korea, integrated local producers with exporters by equally incentivizing both groups. This integration involved two types of indirect exporter: those supplying intermediate inputs to export manufacturers, and those providing finished goods to trading companies for export. Policies that equalized incentives included realistic exchange rates, free trade, competitive markets, and non-discriminatory domestic taxes. Additionally, countries such as Korea supported indirect exporters with financial tools including pre-shipment working capital loans and post-shipment finance (Dinh, 2013a).

Promoting Digitalization for Africa's Industrialization. Sub-Saharan Africa offers a distinct potential for digitalization, considering its lower human capital levels and the dominance of informal economic sectors. By championing and fostering low-skill-focused digital technologies, productivity can be enhanced across different types of enterprises. Strategic adoption of digital solutions can aid these countries in improving MSMEs, advancing technology in the GVCs of large enterprises, and fostering cooperation between these groups.

Digitalization, combined with Industry 4.0 technologies-- defined as the integration of intelligent digital technologies (artificial intelligence, automation, robotics, etc.) into manufacturing and industrial processes--can profoundly impact GVC participation. For example, artificial intelligence (AI) can help companies pinpoint efficient and economical global goods transportation pathways. However, several economic sectors in Africa remain anchored in earlier industrialization phases (Industry 2.0, or the Second Industrial Revolution technologies). These sectors find it challenging to capitalize on Industry 4.0 benefits because of their limited industrial capacity, including infrastructure and skilled workforce deficits. Moreover, many countries have restricted access to essential resources like the internet, mobile connectivity, and electricity.

To tackle these concerns, countries need to enhance information and communication technology (ICT) infrastructure, ensuring reasonable access to high-speed internet and reliable electricity. Governments must actively close connectivity gaps between both small and large firms, and urban and rural regions. Along with ICT infrastructure expansion, establishing standards and regulations is crucial. This is where international assistance is most needed (below).

Equally vital is cultivating human capital in pertinent sectors. In the emerging digital landscape, workers capable of understanding and adapting to modern technologies are needed. As advanced economies predominantly drive new technology development, including Industry 4.0 and green technologies, African countries must tailor and apply these technologies to local conditions. Governments should aid businesses—especially MSMEs—in boosting their digital skills in areas including market research, product creation, and sourcing. Labor-enhancement efforts should especially address women working in informal and artisanal small enterprises, especially entrepreneurial women.

The green and digital revolutions offer SSA countries a chance to update their production methods and contribute to global sustainable development objectives. These shifts are increasingly interconnected and, for maximum advantage, should be tackled collaboratively at both national and international levels. For a successful, fair, and inclusive transition, global policymakers must synchronize their digital and green plans—emphasizing digital skill development, financial support, and international cooperation.

Summary. The policy framework discussed above cannot be put in place and executed by the private sector alone; it requires concerted efforts by both the public and private sectors. This explains why policies that rely on market forces alone have failed to help SSA countries replicate the industrialization success achieved by the East Asian countries. Steadfast government support is vital to sustainable industrialization. Appropriate government support can help SSA countries move onto a development growth path. This does not necessarily imply outright subsidies or other government interventions, which can be counterproductive. A more helpful approach is to analyze the economic chokepoints and take early actions to ease or remove the most serious constraints.

The critical role of learning-by-doing cannot be stressed enough. In manufacturing, nothing can substitute for experience, which can only be gained through doing the work. Entrepreneurs from China to Ghana and Senegal have learned on the job and from relatives and friends. Success requires repeated attempts, often in the same line of business, but, in many cases, after repeated efforts in other fields as well. The policy implication of learning by doing is that, in countries in which manufacturing offers the prospect of sustainable job creation and economic growth, the sector should be encouraged and facilitated without delay.

VIII. SUPPORT FROM THE INTERNATIONAL COMMUNITY

The international community has long recognized the importance of industrialization in Africa. In September 2016, the G20 Leaders' Summit in Hangzhou, China, launched the 'G20 Initiative on Supporting Industrialization in Africa and Least Developed Countries'. While the launch of this initiative was a commendable first step, it did not result in raising more discussion or more awareness about industrialization in general and Africa in particular, or lead to more policy actions being taken. Many G20 members and even beneficiaries surveyed by UNIDO in 2019 were not aware of this initiative (UNIDO Review, 2019). The UNIDO Progress Report therefore suggested three policy remedial actions: i) Elevate the prominence of industrialization within the framework of the G20 agenda; ii) Regularly report on progress and establish connections between industrialization efforts and other G20 initiatives and the 2030 Agenda Action Plan; and iii) Encourage greater collaboration between G20 members and beneficiaries to develop practical measures for industrialization, including the creation of more practical toolkits.

After the COVID-19 pandemic, the G20 agenda had to deal with other pressing issues, and industrialization was not a central focus, as was the case at the 2016 summit. Nonetheless, a number of issues relevant to Africa's industrialization were addressed to varying extents during the 2022 Indonesian and 2023 Indian G20 presidencies. These include strategies to integrate micro, small, and medium-sized enterprises (MSMEs) into the larger, domestic or global value chain (GVC) entities, assist the transition of informal sectors to formal ones, and enhance nations' infrastructure, education, technology transfer, capacity building, digitalization, and green technologies.

Recommendations For Upcoming G20 Presidencies

What remains absent is a unifying central theme that places industrialization at the forefront, serving as a national growth driver for SSA countries. Such a central theme would harmonize and align these diverse policies under a single objective: the growth and development of the manufacturing sector. Future G20 presidencies should, therefore, prioritize the establishment of such a cohesive framework, while highlighting other policies that may not have received adequate emphasis in the recent presidencies. The G20 should also ask the international institutions such as the World Bank Group, the IMF, the African Development Bank, UNDP, and UNIDO to assist African nations

to design and implement individual country industrialization plans. By consolidating these efforts around a central industrialization theme, SSA countries can potentially unlock a more coordinated and impactful approach to addressing their economic challenges, fostering sustainable growth, and meeting the aspirations of millions of young job seekers each year.

1. **Recognition of Africa's Industrialization Role and Policy Support:**

   - Encourage African nations to draft and implement industrialization strategies that stimulate economic growth and job opportunities.
   - Promote business-friendly policies, simplify regulatory frameworks, and cultivate an atmosphere conducive to industrial expansion.

2. **Boosting Agricultural Productivity and Infrastructure:**

To expedite the structural transformation—shifting resources from less productive to more productive sectors—the G20 should aid African countries in:

   - Raising agricultural productivity.
   - Integrating MSMEs into the activities of large domestic or FDI or GVC enterprises.
   - Facilitate productivity enhancement in individual sectors by backing infrastructure projects through financial aid, expertise, and endorsing private sector participation.

3. **Enhancing Trade and Market Accessibility:**

   - Eliminate or reduce trade barriers and ensure enhanced G20 market access for Africa's manufactured goods.
   - Offer SSA nations preferential market access by extending initiatives such as the African Growth and Opportunity Act (AGOA), and the Cotonou Agreement. Also, streamline the AGOA to make it more user-friendly.

4. **Education, Skill Development, and Capacity Building:**

   - Collaborate with African countries to initiate educational ventures to nurture a workforce equipped for GVCs. This should encompass specialized training programs, vocational education, and higher education programs tailored for pertinent industries.
   - Facilitate technology transfer and capacity building in African countries to equip them with the essential skills and knowledge needed for the type of labor-intensive manufacturing discussed.

5. **Promotion of Digitalization and Eco-friendly Technologies:**

   - Assist African countries in fortifying their information and communications technology (ICT) frameworks, and ensuring affordable and reliable high-speed internet and power solutions.
   - Support African governments in nurturing human resources in the digital realm.
   - Champion investments in renewable energy projects and technologies. This not only addresses Africa's energy challenges, but also ensures adequate sustainable growth.

REFERENCES

- Amsden, A. H. 2007. Escape from Empire: The Developing World's Journey through Heaven and Hell. Cambridge, MA: MIT Press.
- Baumol, W.J. 1967.Macroeconomics of unbalanced growth: the anatomy of urban crisis. The American economic review, 57,3, 415-426.
- Baumol, W.J., Blackman, S.A.B. and Wolff, E.N., 1994. Productivity and American leadership. Cambridge, MA: MIT Press.
- Crook, C. 1992. "Third World Economic Development." Online Library of Economics and Liberty. http://www.econlib.org/library/Enc1/ThirdWorld EconomicDevelopment.html.
- Deléchat, C. and Medina, L. 2021. The Global Informal Workforce: Priorities for Inclusive Growth. Washington, DC: International Monetary Fund.
- Denison, E. F. 1982. Trends in American Economic Growth, 1929-1982. Washington, D.C: Brookings Institution.
- de Vries, G., Arfelt, L., Drees, D., Godemann, M., Hamilton, C., Jessen-Thiessen, B., Kaya, A.I., Kruse, H., Mensah, E. and Woltjer, P., 2021. WIDER Technical Note 2/2021-The Economic Transformation Database (ETD): content, sources, and methods.
- Dinh, H.T., Palmade, V., Chandra, V. and Cossar, F., 2012. Light manufacturing in Africa: Targeted policies to enhance private investment and create jobs. World Bank Publications.
- Dinh, H.T., 2013a. Light manufacturing in Vietnam: creating jobs and prosperity in a middle-income economy. World Bank Publications.
- Dinh, H.T., Rawski, T.G., Zafar, A., Wang, L. and Mavroeidi, E., 2013b. Tales from the development frontier: How China and other countries harness light manufacturing to create jobs and prosperity. Washington, DC: World Bank Publications.
- Dinh, H.T., 2017. Case Studies of Decentralized Coordination in China. Chapter 8 in The Practice of Industrial Policy, Oxford University Press, p.145.
- Diao, X., McMillan, M. and Rodrik, D., 2019. The recent growth boom in developing economies: A structural-change perspective. In The Palgrave Handbook of Development Economics (pp. 281-334). Palgrave Macmillan, Cham.
- Diao, X., Ellis, M. McMillan, and Rodrik, D., 2021. Africa's Manufacturing Puzzle: Evidence from Tanzanian and Ethiopian Firms. NBER Working Paper No. 28344.
- Gelb, A., Ramachandran, V., Meyer, C.J., Wadhwa, D. and Navis, K., 2020. Can Sub-Saharan Africa be a manufacturing destination? Labor costs, price levels, and the role of industrial policy. Journal of Industry, Competition and Trade, 20, pp.335-357.
- Gylfason, T. 2001. Natural resources, education, and economic development. European Economic Review, 45, 4, 847-859.
- G20 2016 China. G20 Leaders' Communique: Hanzhou Summit. http://www.g20.utoronto.ca/2016/160905-communique.html
- Hallward-Driemeier, M., and G. Nayyar. 2017. Trouble in the Making? The Future of Manufacturing-Led Development. Washington, DC: World Bank Publications.
- Jorgenson, D. W. 2005. "Accounting for Growth in the Information Age." In Handbook of Economic Growth, vol. 1, edited by Philippe Aghion and Steven Durlauf, 743–815. Amsterdam: Elsevier.
- Juhász R, Lane R, Rodrik D. 2023. The New Economics of Industrial Policy. Annu. Rev. Econ. 16: Submitted. DOI: https://doi.org/10.1146/annurev-economics-081023-024638.
- Juhász, R., N. Lane, E. Oehlsen, and V. Pérez. 2022. "The Who, What, When, and How of Industrial Policy: A Text-based Approach." SocArXiv. August 25. doi:10.31235/osf.io/uyxh9.
- Kruse, H., Mensah, E., Sen, K. and de Vries, G., 2021. "A Manufacturing Renaissance? Industrialization Trends in the Developing World." UNU-WIDER Working Paper 2021/28.
- McMillan, M. and Zeufack, A., 2022. Labor productivity growth and industrialization in Africa. Journal of Economic Perspectives, 36(1), pp.3-32.

- Rodrik, D. 2004. "Growth Strategies." Working paper (August), John F. Kennedy School of Government, Harvard University, Cambridge, MA.
- Rodrik, D., 2016. Premature deindustrialization. Journal of economic growth, 21, pp.1-33.
- Sato, H. 2003. The Growth of Market Relations in Post-Reform Rural China: A Micro-Analysis of Peasants, Migrants, and Peasant Entrepreneurs. Vol. 1 of Routledge Curzon Studies on the Chinese Economy. London: Routledge.
- Rhee, Y.W. 1985. "Instruments for Export Policy and Administration: Lessons from the East Asian Experience." World Bank Staff Working Paper 725, World Bank, Washington, DC.
- Schumpeter, J.1943. Capitalism, Socialism, and Democracy. New York: Harper Collins.
- Solow, R. M. 1970. Growth Theory: An Exposition. Oxford: Clarendon Press.
- Sutton, J. and Kellow,N. 2010. An Enterprise Map of Ethiopia. London: International Growth Center.
- Timmer, P., 2012. The mathematics of structural transformation. International Food Policy Research Institute, 2.
- United Nations Industrial Development Organizations (UNIDO).2019. The G20 Initiative on "Supporting Industrialization in Africa and LDCs." Review of progress.
- World Bank. 2021. The Changing Wealth of Nations 2021: Managing Assets for the Future. Washington, DC: World Bank. doi:10.1596/978-1-4648-1590-4. License: Creative Commons Attribution CC BY 3.0 IGO.

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