



Industrial Diagnostic Study in Guinea 2021

Acknowledgment

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Glossary

AfCFTA: African Continental Free Trade Area Agreement
APIP: Agence de Promotion des Investissements Privés
BTI: Bertelsmann Transformation Index
CAGR: Compound Annual Growth Rate
CO₂: Carbon dioxide
DMC: Domestic Material Consumption
ECOWAS: Economic Community of West African States
EDG: Electricité de Guinée
EPA: Economic Partnership Agreement
FDI: Foreign Direct Investment
GDP: Gross Domestic Product
GNI: Gross National Income
GWh: Gigawatt hours
HDI: Human Development Index
IES: Industrial Export Specialization
ILO: International Labor Organization
INDSTAT: Industrial Statistics Database
INS: Institut National de la Statistique
ISIC Rev. 3: International Standard Industrial Classification, Revision 3
LPNDL: Lettre de Politique Nationale de Décentralisation et de Développement Local
LUP: Latent Untapped Potential
MHT: Medium High Tech
MVA: Manufacturing Value Added
MW: Megawatts
PNDA: Nationale de Développement Agricole
PNDES: Plan national de développement économique et social
PNIASAN: Plan National d'Investissement Agricole, de Sécurité Alimentaire et Nutritionnelle
PONEJ: Politique Nationale de l'Emploi des Jeunes
SDG: Sustainable Development Goals
SITC: Standard International Trade Classification
SME: Small and Medium Enterprise
SSA: Sub-Saharan Africa
UAE: United Arab Emirates
UNIDO: United Nations Industrial Development Organization
USD: United States Dollar
WACIP: West African Common Industrial Policy
WBES: World Bank Enterprise Survey
WGI: Worldwide Governance Indicators

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EXECUTIVE SUMMARY

This industrial diagnostic is meant to provide an analytical foundation to inform the development of a New Industrial Policy for Guinea. It provides a snapshot of the country's past and current industrial performance and capacities. The analysis in this report is conducted by means of data analysis, desk-based review of documents and literature as well as consultations with national stakeholders.

On the macro-level we can conclude that Guinea has not yet successfully initiated a structural transformation process. It still largely relies on resource-based activities in agriculture and mining, shows a highly concentrated export structure and low value-added production that is characterized by a very high level of informality. The huge potential for adding value to natural resources through domestic processing also remains largely unexploited, which in turn leads to a heavy dependence on the export of only two commodities (gold and aluminum ore) to only two main markets (China and UAE). The lack of local capacities in agro-processing has led to a significant import dependency, even for simple food items, and does not allow Guinea to benefit from the opportunities that regional market integration in ECOWAS and ZLECAf. could offer.

The meso-level analysis comes to the conclusion that Guinea needs to move beyond its current heavy specialization in the low-value added segments of the basic metal and food sectors. The chapter identifies, among others, the following potential sub-sectors to drive Guinea's economic development in the country: several food products, prepared animal feeds, precious and non-ferrous metals, pulp, paper and paperboard, casting of metals, grain mill, parts/accessories for automobiles, distilling, rectifying and blending of spirits, publishing of newspaper and journals, and machinery for mining. Most of these potential sub-sectors belong to or are strongly related to the basic metals or food and beverages sectors. Therefore, developing new activities within these sectors seems to be a promising path for Guinea's future.

A viable way of developing new economic activities is unfolding the value chains of existing activities where there are relevant production capabilities. For instance, taking advantage of the large bauxite production to advance to downstream segments of the aluminum value chain, which generate greater value-added, require more qualified workers, and have stronger linkages with the rest of the economy than the mining activities. Gradually, Guinea could build capacity to manufacture alumina and primary aluminum, and target finished aluminum products and other sectors directly linked to its value chain as a long-term development strategy. The agro-processing industry is also another potentially good opportunity to foster socioeconomic development in the country, by not only developing the food industry, where there are already some production capabilities, but also more sophisticated sectors such as packaging materials, feed production, irrigation equipment, tools, manufacture or assembly of simple tractors, production of agrochemicals (fertilizers, pesticides, among others).

The micro-level assessment revealed that even though international measures indicate an improvement of the government performance over the past decade, lacking policy capacities and very limited statistical capabilities make the development of the industrial

sector very challenging. Apart from poor governance capacities, the absence of a comprehensive Industrial Policy, the high degree of informality, access to finance as well as energy capacity and infrastructure represent some of the biggest challenges for the industrial development of Guinea.

Overall, Guinea is in urgent need of a New Industrial Policy, which can effectively promote industrial diversification and upgrading, e.g., through: 1) Identifying and nurturing the most viable agro-industry value chains for domestic as well as international target markets. 2) Avoiding a continued heavy concentration of investment in a few specific sectors, particularly mining and energy, and increasing local content in FDI projects. 3) Incentivizing downstream activities on the basis of the rapidly expanding mining sector that provide larger value addition and linkages. The process of prioritizing concrete industrial policy objectives, intervention areas and instruments must be based on solid evidence. For this, strengthening the statistical capacities to regularly conduct industrial surveys is essential. In addition, dedicated capacity development support should enable the Ministry of Industry to competently lead the process of developing and implementing the policy. The policy development process should follow a participatory approach, where the country's relevant stakeholders' perspectives including those of the informal sector are considered to set concrete objectives for the policy. For this, the limited collaboration between the public and private sector needs to be overcome effectively.

To foster the development of the sectoral potentials identified in chapter 2, the Government must prioritize selected sub-sectors or activities, set clear targets, and put forward a comprehensive and coordinated range of industrial policy interventions that can build production capabilities and facilitate the flourishing of the selected sectors. Within this policy package, it is crucial to address the country's bottlenecks by building productive capabilities, transport infrastructure, and in particular upgrading the energy system. The role of foreign direct investment will probably remain crucial for the process; however, it needs to be ensured that investors comply with the country's development strategy and that their activities benefit Guinea's society.

Given the fact that Guinea's industry is at a very early development stage, it is extremely important to strategically prioritize a small number of key policy objectives in an inclusive manner rather than trying to cover everything at the same time. In addition, the industrial policy needs to navigate the interface with other policy areas carefully. In the short-term, boosting the processing of natural resources domestically will most likely come at the expense of raw material exports, which inadvertently will lead to difficult tradeoffs with the objectives of the national strategies in mining, trade and agriculture. The diversification of industrial activities will in turn need to rely on very ambitious and long-term initiatives in the skill development, energy, infrastructure and innovation fields, which need to be tackled in conjunction with the respective sectoral policy plans.

Introduction

This comprehensive industrial diagnostic of Guinea is divided into three main sections. The first section analyzes the industrial development on the macro level. It examines the economic, social and environmental dimensions of Guinea's industrial performance. In the economic dimension, it explores the country's structural transformation path, analyses the production performance of the manufacturing sector, labor productivity as well as manufactured exports' competitiveness, diversification and regional economic integration. In addition, it covers production enablers such as technology, innovation, investment and finance. In the social dimension, the report analyses Guinea's performance in manufacturing employment, gender equality and youth participation. The environmental dimension is divided into two sections. In a first step the capacity to produce and distribute electricity, energy efficiency and use of renewable energy as well as energy intensity will be assessed. In a second step, CO₂ emissions, material extraction and efficiency as well as deforestation will be covered.

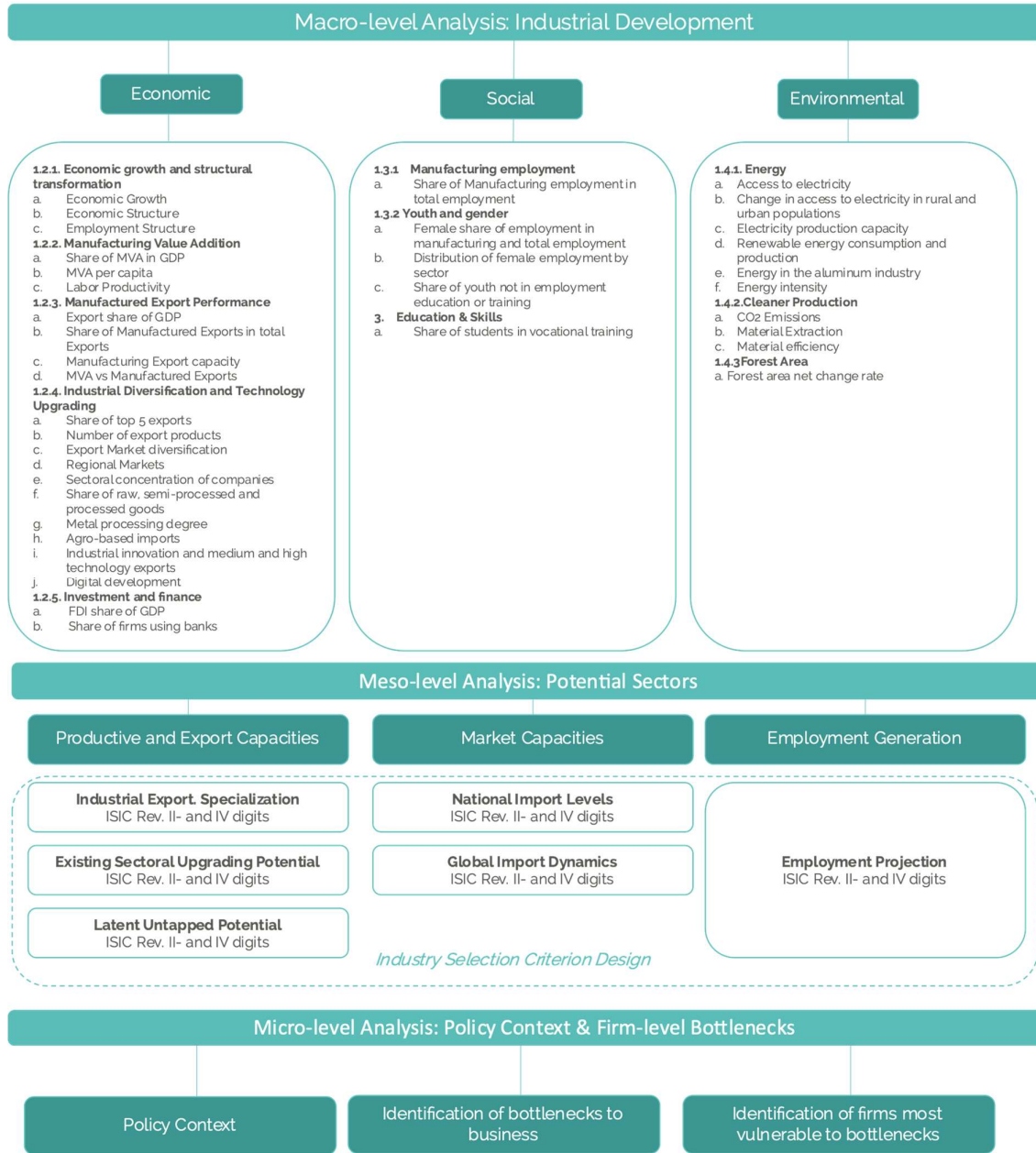
The second section focuses on the meso level and identifies potential key priority sectors and sub-sectors for industrial development. It examines Guinea's export capabilities by looking at the country's Industrial Export Specialization (IES), sectoral upgrading potential of existing sectors, Latent Untapped Potential (LUP), national and international market dynamics, and employment projections of potential sectors.

Section 3 offers a micro-level analysis by using the World Bank Enterprise Survey for Guinea 2016 and other data sources. It identifies key bottlenecks manufacturing firms face. It compares those bottlenecks with manufacturing firms in the ECOWAS regions and provides further insights into the country's challenges. Figure 0.1 illustrates the structure of the report.

The analyses presented in this report have been developed using statistic data from international databases as well as relevant online resources, academic literature, reports from governmental agencies and international organization. In order to contextualize the findings of this diagnostic study, a number of national consultations with relevant stakeholders were carried out. Finally, UNIDO conducted a survey of Guinea enterprises¹ to understand the private sector's perspective on relevant issues covered in the study. The results have been integrated throughout the report. Details on the UNIDO Survey can be found in Appendix D.

¹ Referenced as UNIDO Guinea firm level Survey 2021".

Figure 0.1: Structure of the Industrial Diagnostic



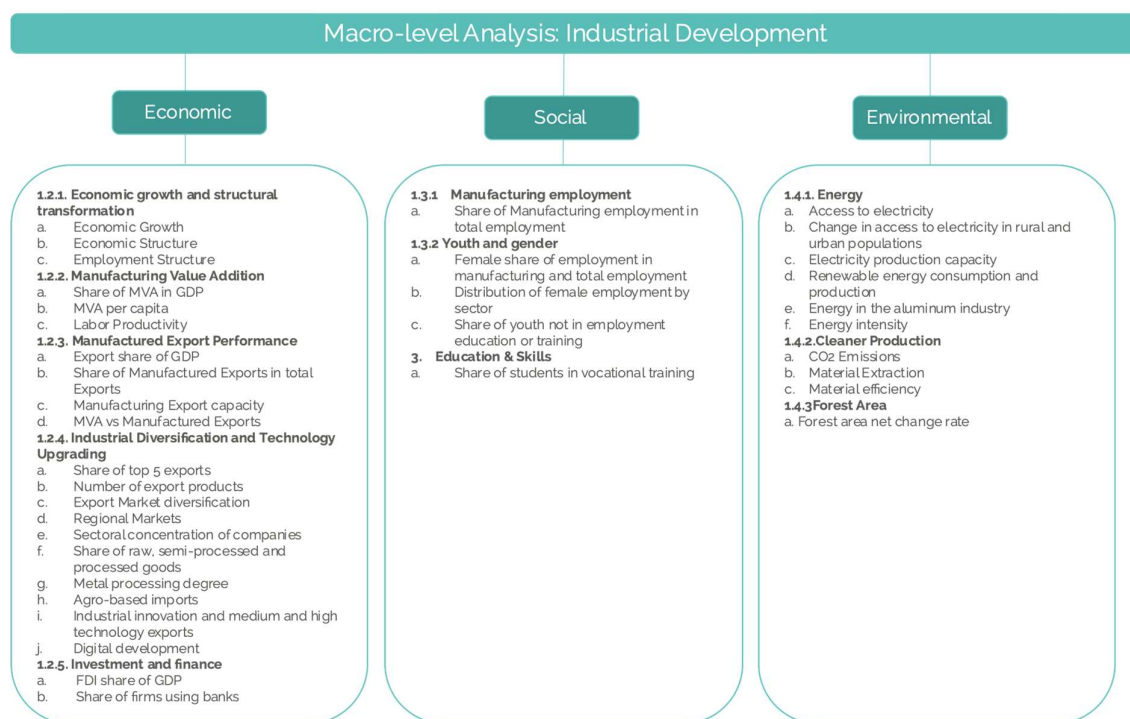
Source: UNIDO - GPI

1. Industrial performance

1.1. Introduction

This section analyzes various topics regarding the industrial performance of Guinea, focusing on the government's priorities as established in the National Development Vision 2040 and its implementation tool the National Economic and Social Development Plan (PNDES) 2016 – 2020. The aim is to obtain a picture of the country's industrialization path. The results of this analysis will shed light on the aspects that deserve attention for the implementation of UNIDO's technical cooperation portfolio in Guinea in general and the development of a new industrial policy in particular. The section is divided into three sub-sections, namely economic performance, social performance and energy & environmental performance. Each analysis is benchmarked against a selected group of countries.² Figure 1.1. provides a visual structure of the macro-level analysis presented in this section.

Figure 1.1. Macro-level analysis structure



Source: UNIDO - GPI

² Note: The benchmark countries have been selected in consultation with the Government in order to represent different levels of industrialization within ECOWAS (Ghana, Senegal and Ivory Coast) as well as a small number of industrialization role models (Ethiopia, Namibia and Morocco). The Average of ECOWAS countries is used throughout the chapter as a reference.

1.2. Economic performance

1.2.1. Economic growth and structural transformation

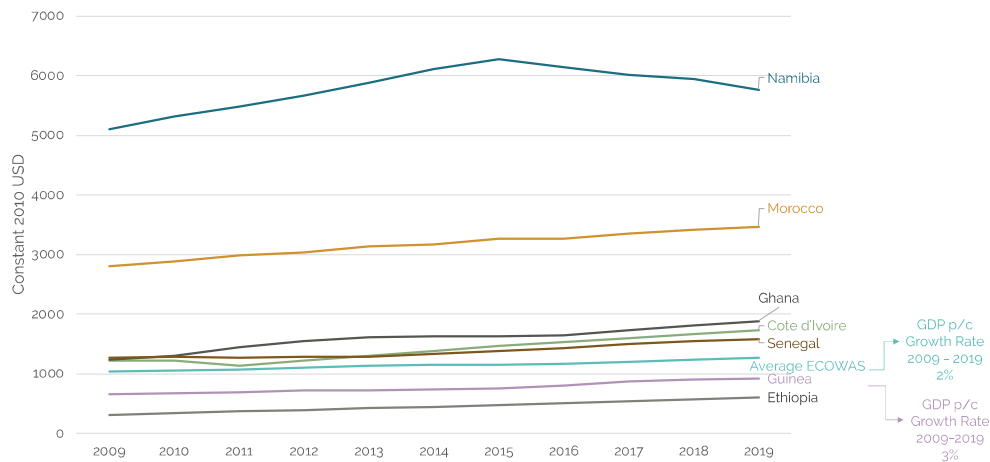
Guinea's Vision 2040 acknowledges the "Structural transformation of the economy" as one of the central pillars for the country's long-term development. Therein, the main objectives are to ***ensure strong and inclusive economic growth, reduce inequalities in regional development, provide the country with infrastructure to support growth, including energy and transport infrastructure, and to promote the development of the industrial and craft sectors.***ⁱ In order to achieve this Vision 2040, the government has developed the "*Plan National de Développement Economique et Social*" (PNDES) 2016-2020, with the overall objective of ***"promoting strong and quality growth to improve the well-being of Guineans and bring about the structural transformation of the economy, while putting the country on the path of sustainable development."***

Despite the country's vast potential and abundance of natural resources, Guinea remains one of the poorest countries in the world. PNDES established a target to increase the Human Development Index from 0,41 in 2014 to 0,48 by 2020. In 2019, Guinea's HDI was 0,47. Considerable progress has been made, yet this still indicates a low level of achievement regarding the basic dimensions of human development.

Economic growth

Guinea's economic growth trend has been considerably affected by a history of political transitions, low commodity prices and the aftermath of the Ebola epidemic.ⁱⁱ With a GDP per capita of 920\$ per person in 2019, it ranks slightly below the ECOWAS average of 1,225\$ per capita (Figure 1.2.). Compared to benchmark countries within and beyond the ECOWAS region, Guinea is noticeably behind, solely ahead of Ethiopia. Nevertheless, over the past decade (2009 to 2019), Guinea's GDP per capita displayed a compound annual growth rate of 3%, while the ECOWAS average in the same period was 2%, which implies a slow closing of the income gap. Likewise, the economy seems to be on a path of recovery after the effects of the 2014 to 2016 Ebola epidemic; within a period of three years (2016 to 2019) the GDP per capita compound annual growth rate has increased by 1%.

Figure 1.2. GDP per capita



Source: World Development Indicators, World Bank.

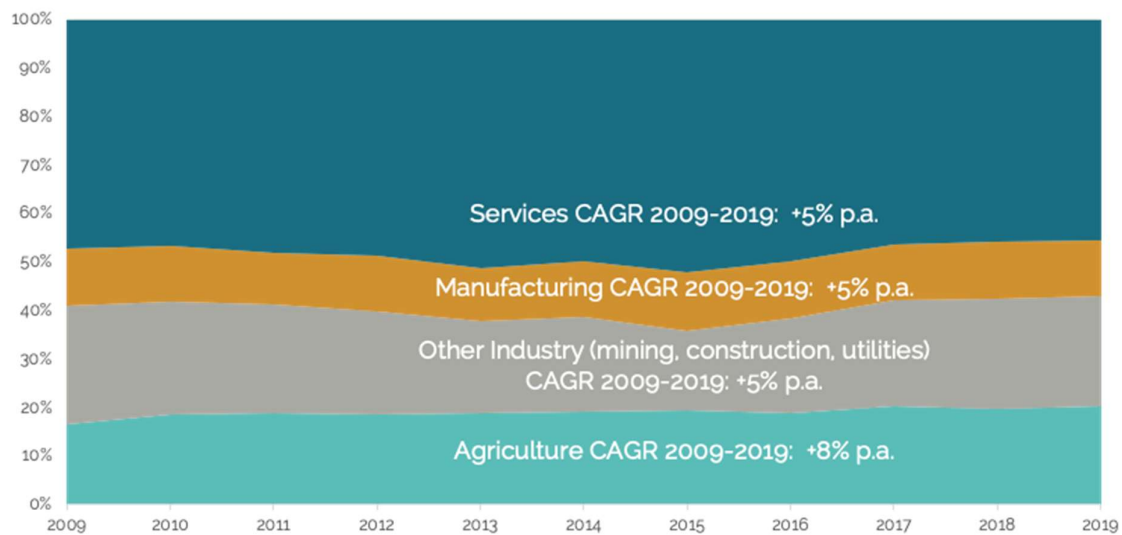
Economic structure

Guinea's natural assets, particularly its geographical position and abundance of rich natural resources, including mining, agriculture and water availability represent the main pillars of its economy. Guinea possesses the largest reserve of bauxite in the world, ore which is used to manufacture aluminum. In terms of agriculture, Guinea's arable land to date remains largely untouched, offering considerable potential for the country's agricultural development and diversification. Further, the tertiary sector offers great opportunities to keep expanding, especially in the tourism and trade sectors, which already are strong pillars of the economy.

Today, Guinea's economy is largely sustained by the tertiary sector (services, mainly driven by commercial and trade activities), which accounted for almost half of the country's GDP (41,2%) in 2019 (Figure 1.3).ⁱⁱⁱ Within the last 10 years, industry value added excluding manufacturing activities (which is mainly driven by mining but also includes construction and utilities) has grown by 5% p.a., continuously contributing 20% to GDP. The agriculture sector accounts for 18,5% of GDP, and at the same time is the fastest growing sector, with a compound annual growth rate of 8,1%. Finally, manufacturing activities contribute 10,3% to the economy, having experienced an average positive growth of 5,5% during the last decade.

In this context it also deserves to be mentioned that Guinea's economy is highly dependent on the informal sector. Based on the PNDES 2016-2020 assessment, informal activities accounted for 47% of GDP. The informal sector accounts for approximately 64% of the service sector value added, while within manufacturing it is estimated to contribute 68% of value addition. This prevalence of the difficult to observe informal sector makes an in-depth industrial diagnostic very challenging.

Figure 1.3. Economic Structure of Guinea (% of Sector Value Added in GDP)



Source: World Development Indicators, World Bank.

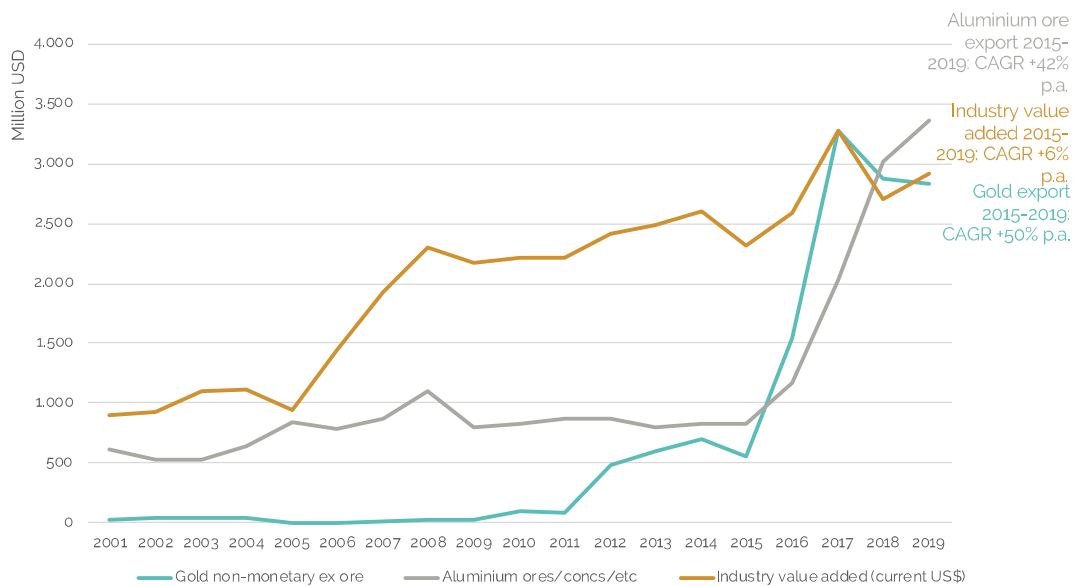
Mining

The mining sector plays an extraordinary role in the country as Guinea's bauxite reserves are estimated at over 40 billion tons, one-third of the world's reserves.^{iv} Additionally, it also has massive unexploited iron deposits estimated at 3.2 billion tons and is home to significant reserves of gold, diamonds, limestone, graphite and a vast variety of other minerals. Even though it contributes a significant share to GDP, based on ILO estimates it only employs around 1% of the population (Figure 1.5). The extractive sector, specifically bauxite, is the key driver of investment. In other minerals, gold and diamond extraction represent a key sector for female work in rural areas^v. As the activity in rural areas is mostly artisanal mining, most of the jobs are created under informality. The government is well aware of the potential as well as the risk that this sector represents if not promoted strategically. In particular the lack of benefit to the society could create tensions among the local communities in the mining regions.^{vi} The Mining Code adopted in 2011 and revised in 2013 laid the foundations by clarifying concession rules and increasing transparency in contracts. Despite a long bauxite mining history in the country, only one alumina refinery with limited capacity has been established and only recently resumed operations after a longer period without operations.^{vii}

The PNDES 2016 – 2020 puts a strong emphasis on the need to integrate the mining sector into the economy while at the same time supporting economic diversification. Currently over 95% of exports are derived from mining products, specifically bauxite and gold. Hence, there is a significant margin for the country to increase the value-added production of natural resources and use the sector's revenues for the development of projects that will benefit the population.

As a note of caution, it has to be highlighted that the sectoral value-added analysis presented above in Figure 1.3, is not founded on recent firm-level surveys of industrial production, as those are unfortunately unavailable in Guinea. Our analysis of mirror data³ for Guinea's exports in Figure 1.4, as well as recent mining production statistics suggest that through rapid production expansions mining has most likely increased its share of GDP significantly during the past 3 years. Accordingly, it is possible, that the current sectoral value-added estimates significantly underestimate today's size of the mining sector due to a lack of recent data availability. The exports of gold and aluminium ore in Figure 1.4, have even exceeded the reported value added of the industry sector since 2016. However, it is not possible to give an exact estimation of the real share of the mining sector in Guinea's economy. All value-added statistics presented in the following sections are most likely affected by this limitation.

Figure 1.4. Guinea's Industry value added vs export of gold and aluminium ore (2001 – 2019)



Source: World Development indicators, World Bank and United Nations UN-COMTRADE.

³ As there is no export data reported for Guinea in recent years (2016-2019) to improve the timeliness of the analysis, this report has used "mirror data" for this period in every export analysis. „Mirror data" is considered a proxy to exports as it informs on imports from Guinea reported by other countries. However, quality of data can vary depending on the reporting countries and must be interpreted with caution.

Agriculture

It is estimated that Guinea possesses more than 6 million hectares of potential farmland, of which 75% are still unused. From more than 300,000 hectares with irrigation potential, only 10% have been developed. Guinea is considered to be the “Water Tower” of West Africa, with a water potential estimated at 27,000 m³ per capita per year.^{viii} In 2019, the primary sector employed 62% of the population (Figure 1.5.), but only contributed to 18,5% of GDP. This implies that the most human resource intensive sector only produces a fraction of the country’s wealth.

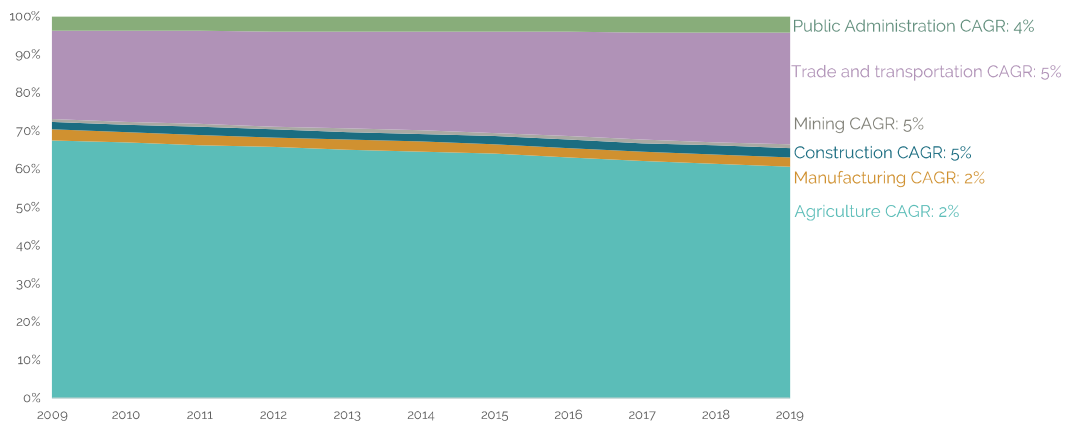
The main subsistence crops are rice, corn, manioc, fonio, potato, sweet potato which are complemented by a limited number of cash crops such as banana, coconut, coffee, cotton, and pineapple.^{ix} Especially in rural areas, agriculture is the dominant sector, accounting for 68% of the labor force^x. The country’s exports are small and still highly concentrated on raw products, due to limited development of national value chains. Farmers largely lack the required skills in order to build business relations, as well as the infrastructure to store and transport products.^{xi} On the other hand, the fisheries and aquaculture sector offer great potential for the country, but must be developed in a sustainable way. Based on the PNDES 2016-2020 numerous efforts have been made to strengthen the institutional and regulatory framework, such as the revision of the maritime and inland fishing codes, the elaboration of policy tools such as the Fisheries Development Policy Letter, the Investment Plan for the Development of Fisheries and Aquaculture, among others.

In 2013 the government developed the National Agricultural Investment, Food and Nutritional Security Plan (PNIASAN), which consisted of five pillars: (i) sustainable development of the rice subsector; (ii) diversification for food security; (iii) promotion of agricultural exports and agribusiness; (iv) integrated natural resources management; and (v) institutional capacity building and strengthening. Yet, due to inadequate sectoral institutional capacity, the content of the PNIASAN left a lot to be desired. It has recently been reviewed and validated in conjunction with the National Agricultural Development Policy (PNDA).^{xii}

Services

The tertiary sector employs 33% of the population (Figure 1.5.) while it contributes more than 40% to GDP. The main focus of the service sector is in retail trade, telecommunications and finance, while tourism is seen as a great potential for future growth. Besides its strong role in the economy of Guinea, the tertiary sector still faces challenges. It is strongly dominated by informal activities. Most noticeably, the informal sector corresponds to 87% in trade, 97% in hotels and 77% in transport and telecommunications.^{xiii}

Figure 1.5. Employment Structure of Guinea (% of Sector Employment)



Source: ILOSTAT

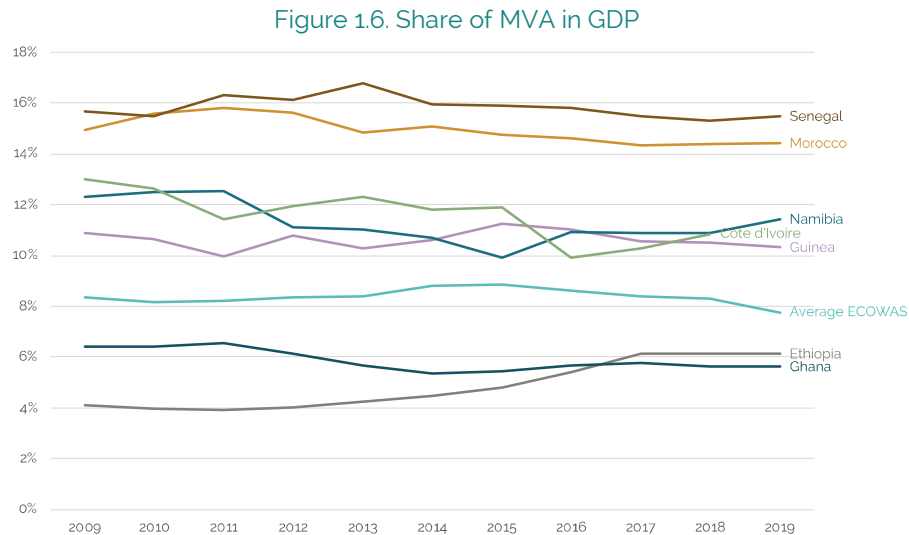
Overall, this analysis highlights the fact that the Guinean economy has not yet witnessed a process of structural transformation which could reduce its dependency on resource-based activities in mining and agriculture and strengthen the role of the manufacturing sector. Instead, the dominance of the mining sector remains significant in terms of value addition, while the agriculture sector as well as low value-added services absorb the majority of labor. The recent expansion of mining activities in the country is likely to reinforce this pattern further.

1.2.2. Manufacturing value addition

The contribution of manufacturing to the economy demonstrates the importance and role of the sector for national development (Figure 1.6.). In 2019, the manufacturing sector contributed 10.3% to the Guinean economy. While this share is higher than the ECOWAS average (7.8%), Ethiopia (6.1%) and Ghana (5.6%), it still falls behind Cote d'Ivoire (10.8%), Namibia (11.4%), Morocco (14.4%) and Senegal (15.5%). An analysis of the growth trend reveals that the sector has slightly decreased rather than enhanced its contribution, given that in 2009 its share of GDP was 11%. Considering the underestimation of the mining sector value added discussed above, the share of manufacturing in GDP is potentially significantly lower than the data presented here suggests. As far as employment is concerned, the share of the manufacturing sector in total employment even decreased from 3% in 2009 to 2.5% in 2019 (figure 1.5). In summary, the country's manufacturing sector is small, provides little employment and lacks diversification. Most activities are resource-based, highly concentrated on basic processing of the country's bauxite as well as a small number of agro-industries.^{xiv}

PNDES 2016-2020 was established with the objective of "promoting a sustainable, competitive industry that creates productive employment". Three main effects are expected: i) that the mining sector becomes the catalyst for the structural transformation, ii) to increase the manufacturing industry's contribution to the creation of productive jobs and wealth and iii) to promote clean industries.

Moreover, the West African Common Industrial Policy (WACIP) vision is to ***“maintain a solid industrial structure, which is globally competitive, environment-friendly and capable of significantly improving the living standards of the people by 2030.”*** To achieve this vision, the region expects to increase the manufacturing industry’s contribution to the regional GDP to 20% by 2030.^{xv}



Source: World Development Indicators, World Bank.

The PNDES 2016–2020 emphasizes the need for stronger policies at the sectoral level, particularly for high value-added activities and agro-based value chains. Industrial capabilities represent key components of a country’s industrialization journey. They entail the country’s set of physical, human and institutional infrastructure that supports and enables the productive economy and industrial competitiveness. Some important aspects in this regard are investing in appropriate infrastructure, developing skilled human capital and improving the business environment, among others. Based on the **PNDES Final Progress Report 2019**, the government has already achieved some progress on these relevant issues. Under the Pillar 1, ***“Promotion of good governance for sustainable development”***, efforts to lend support to SMEs through tax regime simplification have been made. Likewise, through its development plan the government has established a set of measures to facilitate access to water and electricity for productive activities. Furthermore, a strong emphasis on formalization of the private sector, which is key for a fair and sustainable industrial development of the country, has been prioritized. Under Pillar 2, ***“Sustainable and Inclusive Economic Transformation”***, the government undertook a number of actions in order to put into place the necessary structural conditions to drive a dynamic and sustainable transformation of the Guinean economy. Through the improvement of the business climate, small yet promising sectors have been promoted, such as those of chemicals, beverages and food industries.

MVA per Capita

MVA per capita is a key indicator to measure the industrial capacity of a country. As it accounts for the size, it allows to compare and learn from benchmark countries despite their larger populations. Figure 1.7. compares Guinea's MVA per capita level in 2019 on the Y axis as well as the recent MVA growth trend (CAGR 2009-2019) on the X axis with all ECOWAS countries. With an MVA per capita of 95 USD in 2019, Guinea's industrial capacity falls slightly below the ECOWAS average as well as that of Ghana. In particular compared to the leading countries within ECOWAS, Senegal, Cape Verde and Nigeria, which all reach levels above 200 USD, Guinea is still far behind. On the other hand, Guinea's manufacturing sector is growing at a slightly quicker rate than that of other ECOWAS members. From 2009 to 2019 Guinea's MVA per capita increased by 3% per year, while the ECOWAS average grew at 2%. According to this comparison Guinea can be characterized as a catching-up⁴ country that is slowly closing the gap to other ECOWAS members thanks to its above average growth rate. This stands in contrast to six member states that are "falling behind", as both their levels and growth rates are below the regional average.

Figure 1.7. Industrial Capacity and Growth



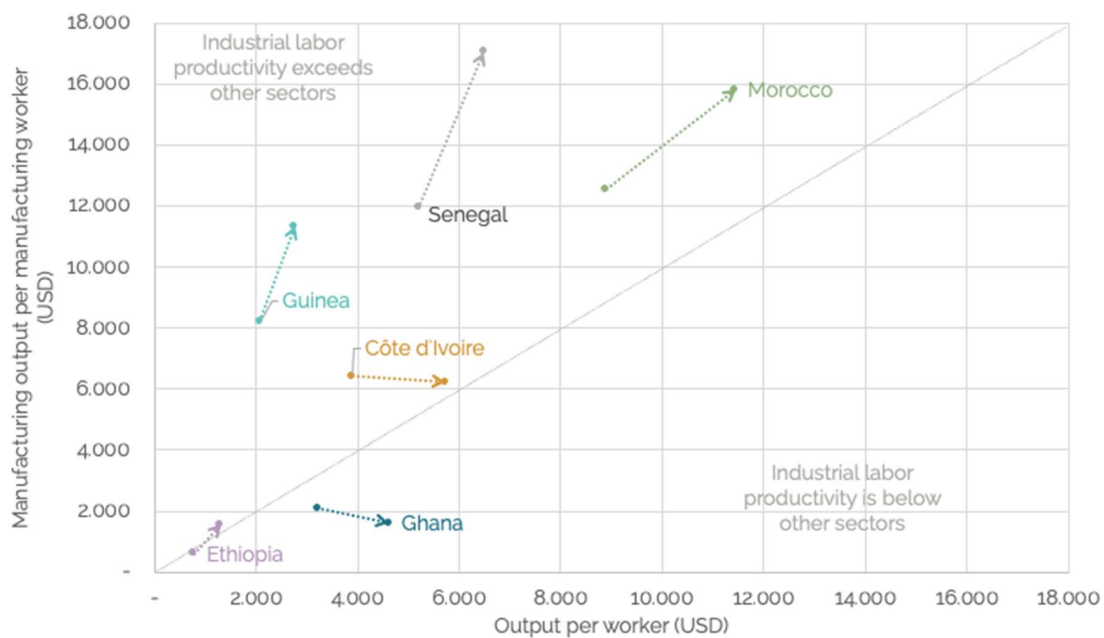
Source: World Development Indicators, World Bank.

- 4 1) **Achievers** show a performance level that exceeds the ECOWAS average, but a growth trend that is below the average.
- 2) **Forerunners** demonstrate an above average level as well as growth trend in the respective indicator and hence are further increasing their leadership role in the performance dimension.
- 3) **Catching up** countries perform at a lower level than the ECOWAS average, but their growth trend exceeds that of most other states.
- 4) **Falling behind** states traditionally play a smaller role in the industrial development of the region and their slow or negative growth trend leads to an increasing gap to more successful countries.

Labor productivity

Productivity dynamics are of key importance for structural transformation and economic development. Labor productivity is defined as the amount of value addition generated by the average employee. This indicator is relevant for developing countries, as it points to the productivity differences across sectors that the country is focused on, e.g. manufacturing vs agriculture. Figure 1.8 illustrates the labor productivity at a national level on the X axis. Guinea indicates one of the lowest levels of productivity with 2,767 USD per worker in 2019. Namibia's labor productivity with 19,178 USD per worker is more than six times higher than that of Guinea, while Morocco and other ECOWAS countries also exhibit a significantly higher level.

Figure 1.8. Manufacturing and Total Labor Productivity 2009 vs. 2019



Data Source: World Development Indicators (World Bank) and ILOSTAT

This productivity challenge becomes even clearer when we look at productivity levels across sectors. On the Y axis, figure 1.8. shows manufacturing labour productivity in 2009 and 2019 for Guinea and benchmarking countries. Senegal and Morocco are leaders in manufacturing labour productivity with 17,056 USD and 15,808 USD respectively. Guinea followed a positive growth trend and reached 11,342USD per manufacturing employee in 2019. However, this comparatively high level is most likely influenced by the dominance of the basic transformation of minerals, which exhibit large output but do not possess the capacity to absorb a large number of workers, and hence display a high labor productivity. A study developed by the World Bank in 2020^{xvi} found that agriculture in Guinea is the least productive sector, and that productivity in mining is 54 times larger and in manufacturing 7.5 times larger than that of the agricultural sector. According to this study, the large productivity gaps among sectors point to the underdevelopment of the country. The productivity differences between industry and other sectors is also illustrated by the

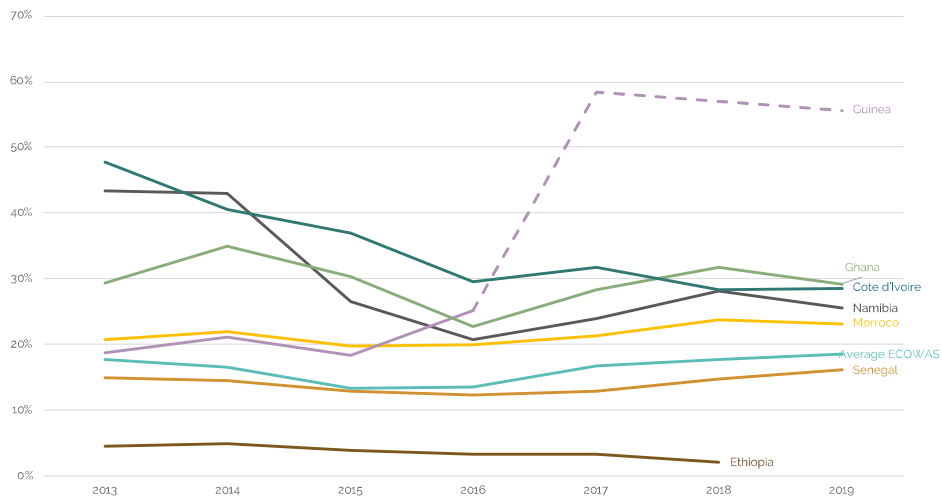
45° line in Figure 1.8., with countries above the line showing higher productivity in industry than in other sectors, while countries below the line show higher productivity in non-industrial sectors (e.g. services). A shift of labor to sectors with higher productivity through a process of structural transformation can lead to significant productivity gains in the economy and should be considered a priority for the Industrial Policy of Guinea.

1.2.3. Manufactured export performance

Export dominated economy

Guinea's economy is highly exposed to externalities due to the fact that exports contributed 56% to GDP in 2019 (Figure 1.9). In stark contrast, other benchmark countries do not exceed a share of 30%, while the average of the ECOWAS region is less than 20%. The high dependency and volatility of exports in Guinea during recent years represents a significant risk for sustainable economic growth. The more the economy relies on resource-based exports, the higher the vulnerability to external shocks such as changes in global demand and prices. Guinea's main export products, which account for over 90% of total exports, are bauxite and gold (see Figure 1.14.) which are both strongly exposed to market volatility. It is therefore essential for the country to develop an industrial strategy that provides a balance between the domestic and the external market by diversifying the economy and, at the same time, ensuring that the population's basic needs are covered.

Figure 1.9. Contribution of Total Exports to GDP



Source: United Nations UN-COMTRADE (2020) database.

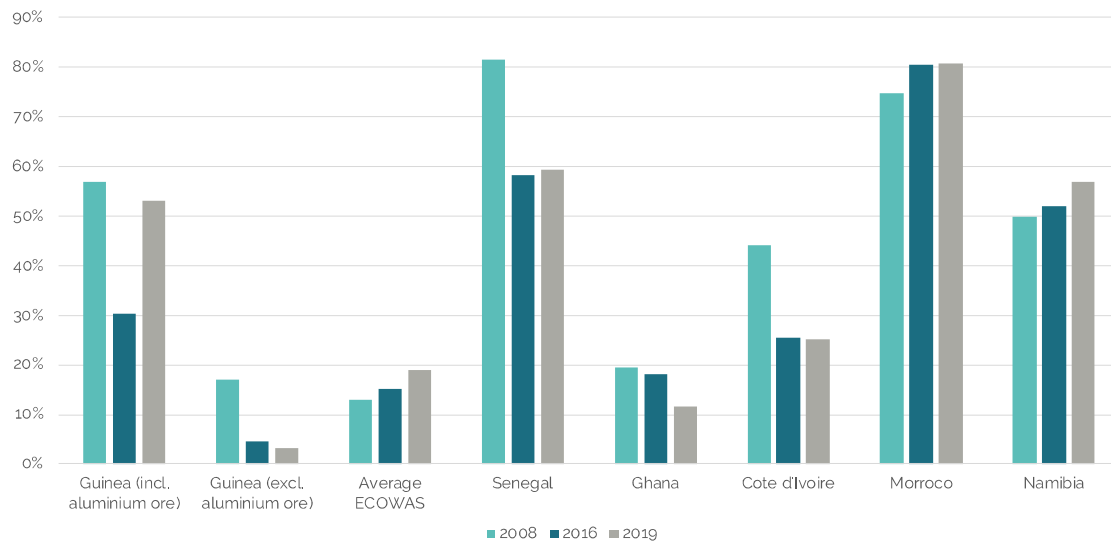
The role of manufacturing in exports

It is important to understand the role of the manufacturing sector in Guinea's export activity in order to see whether the country is moving towards exporting manufactured products or its export basket is still dominated by primary goods. According to UNIDO's standard classification, aluminum ore and concentrates is classified as a resource-based manufacturing product. While this product group formally counts as manufactured, it shares the key characteristics of primary commodities as their value largely stems from the raw material rather than from the production process. This is even more true in Guinea which almost exclusively exports aluminium ore rather than refined concentrates (alumina) today. (UNCTAD, 2011)^{xvii} To account for this important feature, this report presents the data for Guinea's manufactured exports including as well as excluding aluminum ore and concentrates.⁵

Figure 1.10 shows that in 2008 Guinea (incl. aluminum ore) had a share of manufacturing exports in total exports of 57%. This is noticeably higher than that of the ECOWAS average, which in the same year was 13%. However, Guinea's manufacturing export excluding aluminum ore accounted for only 17% of total exports in the same year. While the share of manufacturing exports including aluminum ore remained above 50% in 2019, the share of other manufacturing exports dropped to only 3% of total exports. Essentially, as aluminum exports grow, the role of other products' declines significantly. If we exclude aluminum ore, Guinea has the lowest share of manufacturing export among the benchmark countries and the decline of the share is further contrasted by an increase in the ECOWAS region. The PNDES 2016-2020 expected to achieve a share of manufacturing exports in total exports of 12,5% by 2020. Based on this analysis, these targets are far from being reached.

⁵ Export performance analysis has been developed on the basis of UNIDO's Competitive Industrial Performance Index (CIP) manufactured export classification. Details can be found in Appendix A of this report. To define Guinea's manufactured export excluding aluminum ore, we have subtracted product 2851 (SITC rev 3) to total manufactured exports.

Figure 1.10. Share of manufactured exports in total exports



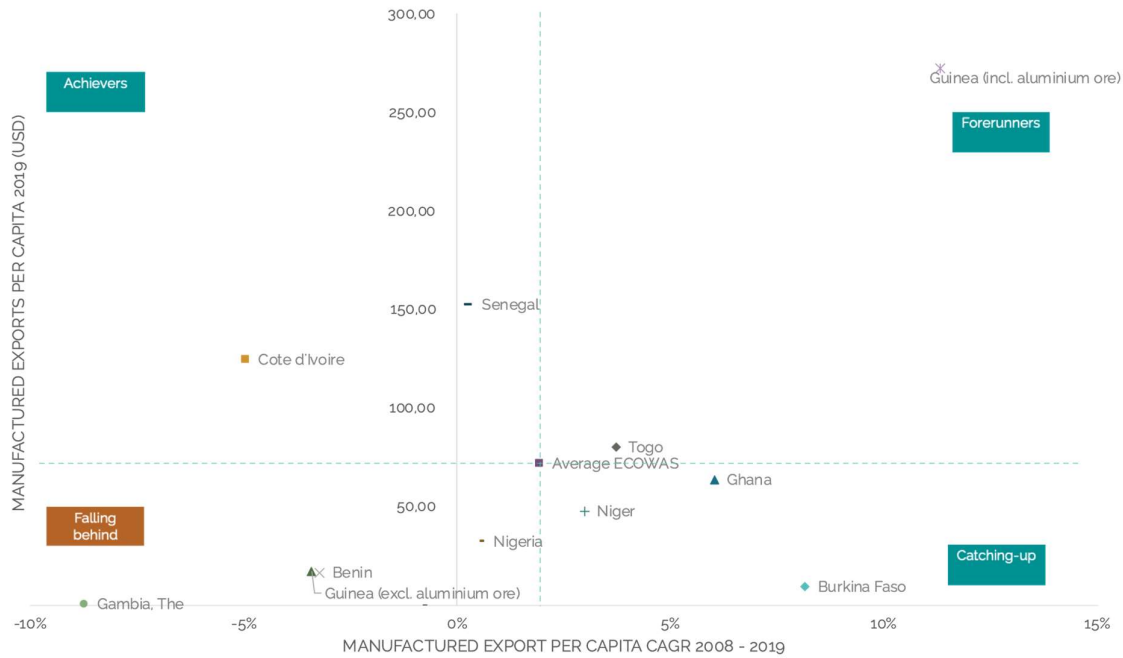
Source: United Nations UN-COMTRADE (2020) database.

Manufacturing export capacity

While the share of manufacturing exports in total exports reflects the structure of a country's export basket, manufacturing export per capita highlights the export capacity and trade competitiveness of the sector. Figure 1.11 illustrates ECOWAS countries' manufacturing exports per capita in 2019 (Y axis) as well as the compound annual growth rate (CAGR) of the same indicator from 2008 to 2019 (X axis). This analysis indicates that Guinea (incl. aluminum ore) is located far beyond the ECOWAS average and is growing much faster than its peer countries. In 2019 Guinea (incl. aluminum ore) exports reached 272 USD\$ per person, with a compound annual growth rate of 11%. That is significantly higher than that of the ECOWAS average, whose growth rate was 2% and reached an average manufacturing export per capita of 72 USD\$ per person in 2019.

This analysis suggests that Guinea (incl. aluminum ore) and Togo are "forerunners" in the region, since both the growth rate and level are above average. However, if we exclude aluminum ore from the analysis, Guinea's manufacturing exports amount to only 17 USD per capita, far below the ECOWAS average, and show a decreasing trend with a compound annual growth rate of -3% p.a. This suggests that Guinea is actually "falling behind" within the region. On the other hand, with a growth rate of 6% p.a. Ghana is catching up quickly, while Cote d'Ivoire and Senegal exhibit the highest manufacturing exports per capita levels and stand out as the "achievers" within the region.

Figure 1.11. Manufacturing Exports growth and level

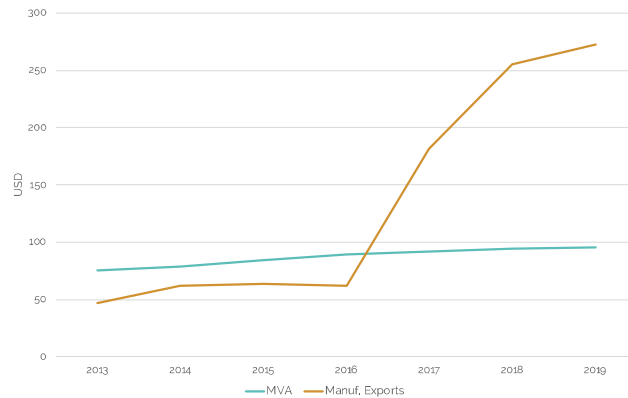


Source: United Nations UN-COMTRADE (2020) database.

Export focus of industry

To conclude this section on manufactured exports it is interesting to compare the recent developments in terms of Guinea's manufactured trade to those in value addition. Figure 1.12 shows that since 2016 manufacturing export values exceeded MVA considerably in the country. In the case of Guinea this pattern is likely due to the fact that the manufacturing sector of the country is highly dependent on the basic processing of raw materials, which increases exports without a significant increase of value addition. This pattern illustrates the limitations that a resource-based export-oriented development trajectory entails as more exports do not necessarily lead to more value addition and hence societal benefits are minimal. The next section will look at two key aspects that are crucial for overcoming this challenge: industrial diversification and technology upgrading.

Figure 1.12. Guinea's MVA and Manufactured Exports incl. aluminium ore



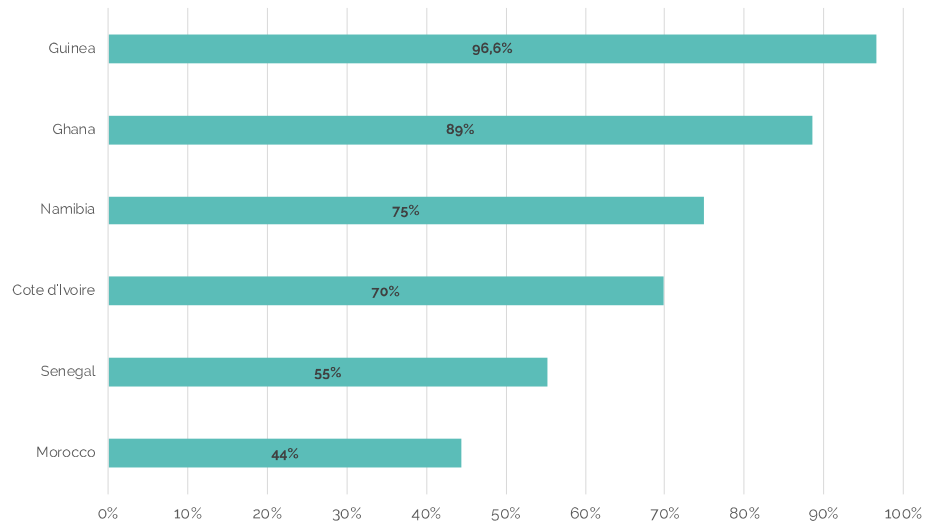
Source: United Nations UN-COMTRADE (2020) database and World Development Indicators (World Bank)

1.2.4. Industrial diversification and technology upgrading

Export concentration

It is not uncommon for resource-rich countries like Guinea to get trapped in the production and export of only a few primary goods. Productive and export structure diversification is a key driver of economic development, especially for economies in an early growth stage. A good indicator for understanding how diversified or concentrated the export basket of a country is, can be derived from calculating the cumulative share of the top 5 export products. While large shares indicate a highly concentrated export structure, lower numbers indicate a more diversified economy. Figure 1.13 indicates that the concentration of Guinea's export in 2019 amounted to 97%. Countries such as Ghana, Namibia and Cote D'Ivoire show export concentrations between 70% to 89%. The difference between Guinea and more diversified countries such as Morocco and Senegal, who reach only 44% and 56% respectively is even more striking. Guinea's Vision 2040 aims at achieving "**a diversified, competitive economy...**". The government acknowledges that there is a positive relationship between diversification and income levels, therefore Guinea must build productive capabilities and engage in new areas to reduce the dependency on a limited number of activities and a small number of commodities.

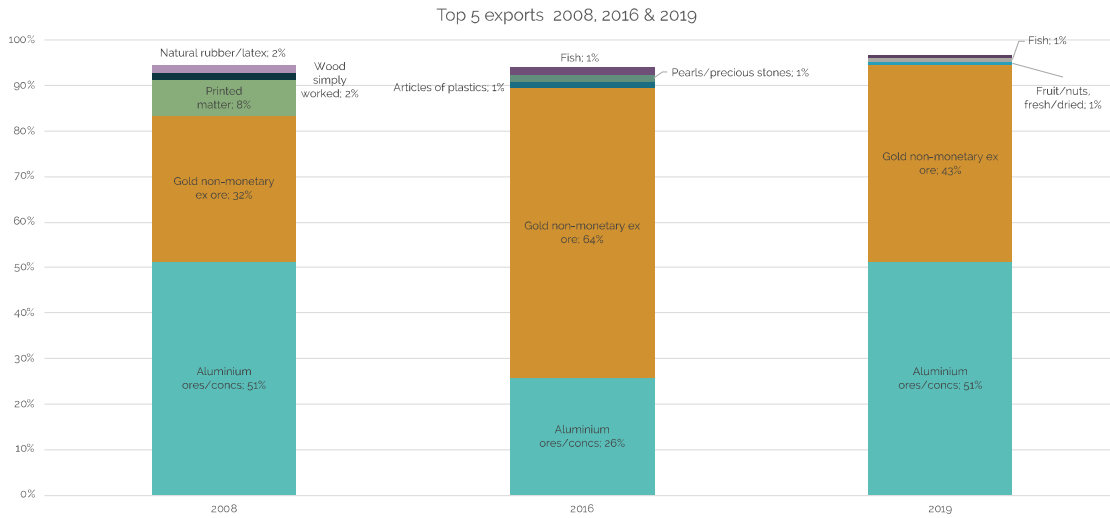
Figure 1.13. Share of top 5 exports in total exports (%) in 2019



Source: United Nations UN-COMTRADE (2020) database

However, a dynamic analysis shows that no progress has been made in this area. In fact, the top 5 export products accounted for 94% of all exports in 2008 (Figure 1.14). The main sectors in that year were Aluminum ores (51%), Gold (32%), Printed matter (8%), Wood (2%) and Natural rubber (2%). Until 2016, the high concentration level was maintained while aluminum decreased to 26%, and it was replaced as the major export product by Gold, which increased its share to 64%. The export concentration rate of 97% in 2019 is still dominated by Aluminum (51%) and Gold (43%), which together make up 94% of the country's exports. This pattern leaves Guinea extremely vulnerable to external shocks. Not only does the country have a very limited range of productive activities, but they are highly concentrated in only two resource-based sectors with very low levels of value addition and employment potential.

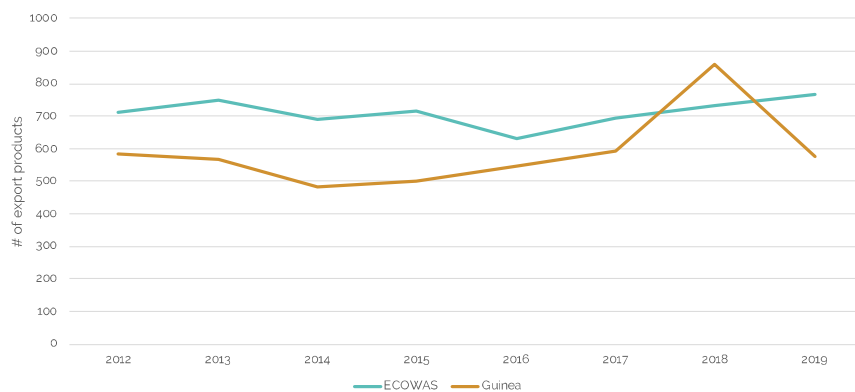
Figure 1.14. Guinea's Top 5 exports in 2008, 2016 & 2019



Source: United Nations UN-COMTRADE (2020) database

In addition, Guinea's total number of export products has also remained very low, reaching only a total of 576 products among the more than 5,300 products that exist in the 6-digit Harmonized System Nomenclature (Figure 1.15), while the ECOWAS region is responsible for exporting on average around 786 products in 2019. Based on a study developed by the World Bank in 2018 "Guinea's Systematic Country Diagnosis", there is also a decline of the number of exporting firms in Guinea. The share of firms exporting directly or indirectly declined from 14,7% in 2006 to 8,2% in 2016.^{xviii} General policy interventions for Improving the business environment, investing in infrastructure, logistics and supporting the access to finance are some of the factors that can improve private sector development and, therefore, export diversification. A detailed analysis on the main bottlenecks for the development of the manufacturing sector can be found in Chapter 3 of this diagnosis.

Figure 1.15. Number of export products

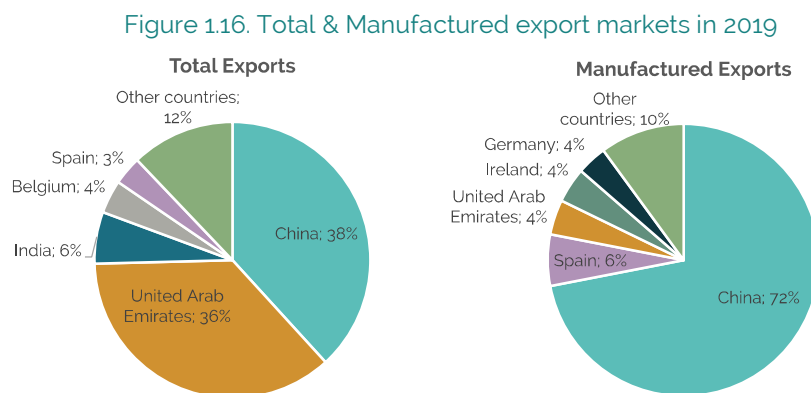


Source: United Nations UN-COMTRADE (2020) database

In addition, the Government is committed to implement various instruments to support the country's economic diversification. The recently established ^{xix} Industrial and SME Development Fund (FODIP) aims at mobilizing and using public and private, national and

international resources to promote the industrial and SME development in Guinea. The Private Sector Promotion Policy Letter^{xx} adopted in 2017 aims at (i) improving the environment for private investment; (ii) strengthening private sector support institutions and the capacity of enterprises (especially SMEs); (iii) enhancing the role of the private sector (public dialogue on competitiveness issues); (iv) promoting an appropriate framework for partnership between universities and enterprises, so that the latter may contribute to the financing of university research, the results of which should ultimately be used to increase the productivity of enterprises. While these foundational interventions are important, Guinea should also consider more proactive industrial policy instruments, including stricter local content requirements in the mining sector, to stimulate the diversification of its industrial base.

The analysis of Guinea's export markets in Figure 1.16 further substantiates the heavy concentration of the Guinean economy. In 2019 Guinea's top 5 export destinations accounted for 88% of the total exports and the main markets were China, United Arab Emirates and India. The markets for manufacturing products (incl. aluminum ore) are even less diversified, with the top 5 destinations making up 90% of manufactured exports. The most important destination of manufactured products from Guinea by far is China with 72%, followed by Spain (6%) and the United Arab Emirates (4%). The lack of diversification of export markets increases the vulnerability that the heavy dependency on only two commodities brings about. It is particularly worrying that Guinea's export revenues rely on only two trade relationships, aluminum ore exports to China and gold exports to UAE. Considering the heavy dependency on exports rather than domestic market-oriented production, Guinea's economic prospects today entirely depend on the aluminum demand in China as well as the gold demand in UAE. Overcoming this vulnerability requires a progressive industrial policy which strategically reduces the dependency on resource-based products and actively builds capabilities for the diversification and structural transformation of the Guinean economy.



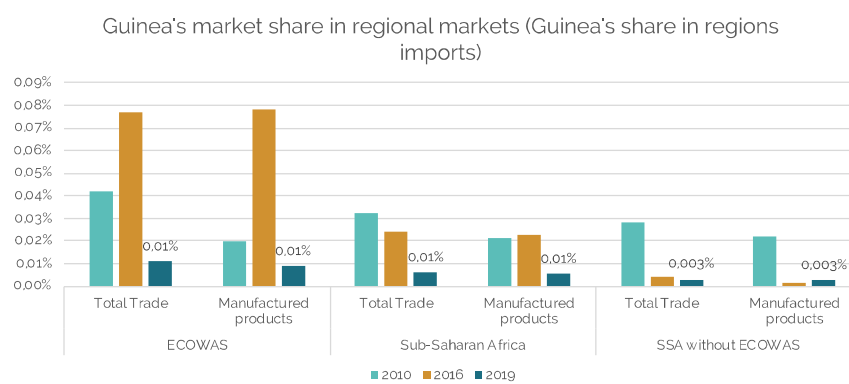
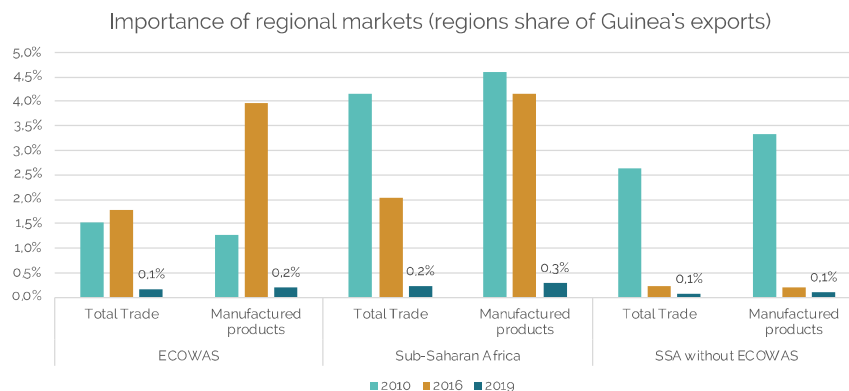
Source: United Nations UN-COMTRADE (2020) database

Regional Integration

One starting point for overcoming the large dependency on resource-based exports to China and UAE is the active integration of Guinean industry within the ECOWAS region. Regional economic communities can play an important role for countries who are trying to establish themselves in global markets. Generally, some of the benefits from participating in regional market integration initiatives are lower logistical costs and shared infrastructure costs, similar competitiveness levels, short distances, similar institutions, among others. In this regard, the ECOWAS regional industrial policy WACIP aims at "progressively increasing intra-community trade in West Africa from less than 12% to 40 % by 2030, with a 50% share of the region's trade in manufactured goods" (WACIP, 2010). Nevertheless, Guinea's main trading partners remain outside of the region.

Figure 1.17 shows that the regional markets of ECOWAS and Sub-Sahara Africa are almost irrelevant for Guinea's exports today. While ECOWAS accounted for roughly 4% of Guinea's manufactured exports in 2016, this share is now down to only 0.2%. Non-ECOWAS regions in the continent are even less relevant, accounting for only 0.1% of Guinea's manufactured exports. This stands in stark contrast to other ECOWAS member states, e.g., more than 60% of Cote D'Ivoire's manufactured exports are sold on the ECOWAS market. Guinea is signatory to several trade agreements in the region, including the ECOWAS Trade Liberalization Scheme (Customs Union), the African Continental Free Trade Area Agreement (AfCFTA) and the Economic Partnership Agreement (EPA) between ECOWAS States and the European Union. Its geographical position and its water and energy potential, offers plenty of opportunities for the country to gain position in such agreements and take full advantage of the benefits. However, the main challenge is said to be the transportation and infrastructure development in order to reduce the cost of doing business within the region.^{xxi} The analysis of the market share of Guinean products on regional markets in the lower part of Figure 1.17 however highlights some even more fundamental challenges. The type of products that regional markets demand, are currently not being offered by Guinean exporters at all. Hence the share of Guinean products on the ECOWAS market for manufactured goods stands at only 0.01% in 2019. The same is true for other regions in Sub-Sahara Africa. This analysis shows that Guinean companies are currently not yet able to actively benefit from regional integration. This can only change if the country starts producing a wider variety of manufactured goods that show a large demand on the regional markets. From a policy perspective the conclusion is that trade liberalization and regional integration cannot substitute active industrial policy interventions for the creation of domestic productive capabilities. ECOWAS member states that liberalize their trade but do not nurture domestic industries will inadvertently become highly import dependent without being able to benefit from export opportunities.

Figure 1.17. Regional Markets

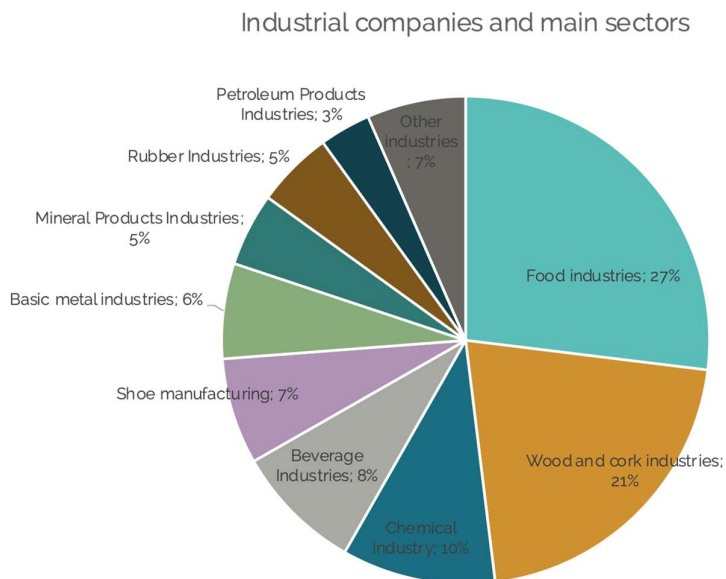


Source: United Nations UN-COMTRADE (2020) database

Concentration in low value-added sectors

In addition to the lack of diversification, another challenge for Guinean industry is its concentration on sectors with low technological sophistication. Figure 1.18 shows the sectorial distribution of industries in Guinea, based on the Industrial Statistics Yearbook. In 2018, 412 companies were officially registered in the National Social Security Fund. By far the largest number of these companies can be attributed to low-value added sectors: Food industries represent 27% of the companies registered that year, followed by the wood and cork sector with a share of 21% as well as beverages, shoe production, etc. On the other hand, the chemical sector with 41 registered companies (10%) may offer some potential for both diversification and for increasing value added in the productive structure. However, the size distribution of these companies offers an indication of the economy's early stage of industrialization: 55% of the enterprises are classified as SMEs (1 to 49 employees), whereas only very few (5%) employ 50 or more workers, with the rest of the companies classified as unspecified.^{xxii}

Figure 1.18. Industrial companies by sectors registered in the National Social Security Fund in 2018

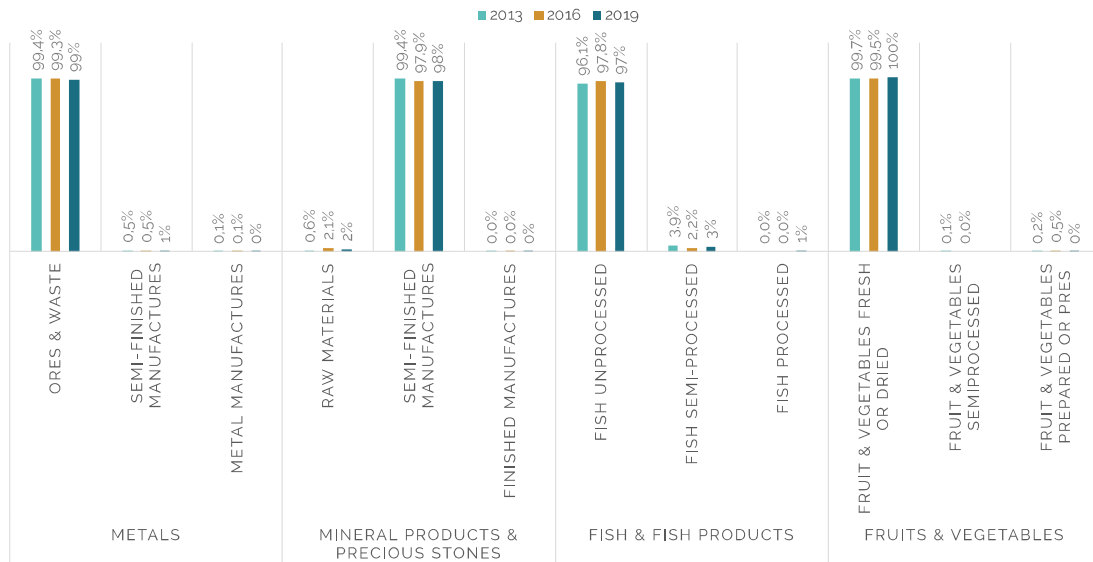


Source: Annuaire Industrie Guinée 2018

Adding value to resource-based exports

Both Vision 2040 and PNDES 2016 – 2020 place a strong emphasis not only on economic transformation, but on adding value to specific resources, for example, to increase the participation of the primary (agriculture and fishery) and extractive sector in all levels of national and international value chains through manufacturing.^{xxiii} In this respect Figure 1.19 illustrates the processing degree of Guinean metals, minerals, fish and fruit & vegetable exports in recent years; Across time, 99% of the country's metals are exported in their raw form, while in 2019 only 1% was semi-processed and manufactured metal products were virtually inexistent. On the other hand, 98% to 99% of mineral products (mainly gold) were exported as semi-finished products but finished goods were equally inexistant. Within the agro-based value chains, Fish and Fruits & Vegetables exports are highly concentrated on raw materials, ranging from 96% to 100%, while finished products remain insignificant.

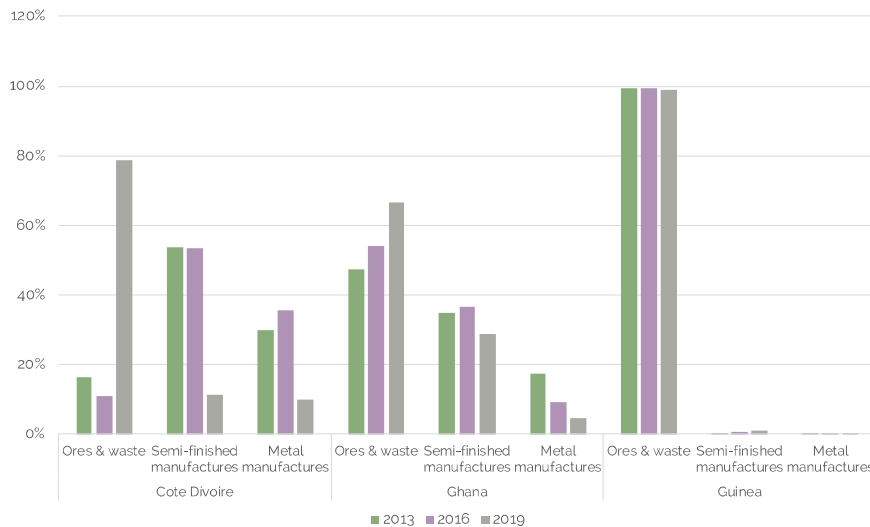
Figure 1.19. Share of raw, semi-processed and processed goods exported for selected sectors in Guinea



Source: United Nations UN-COMTRADE (2020) database

In contrast to these findings, the specific objective of the WACIP strategy is to “diversify and broaden the region’s industrial production base by progressively raising the local raw material processing rate from 15-20% to an average of 30 % by 2030”. Figure 1.20 shows the metal sector processing degrees in two ECOWAS countries compared to Guinea. Despite Guinea’s unmatched resource endowment, Ghana and Cote D’Ivoire export a far greater quantity of semi-processed and finished metal products. On the other hand, the recent trend also shows a shift towards larger shares of metal ore exports in these countries, which illustrates that the challenge of adding value to raw materials has not yet been overcome in the ECOWAS region.

Figure 1.20. Metal processing degree by country



Source: United Nations UN-COMTRADE (2020) database

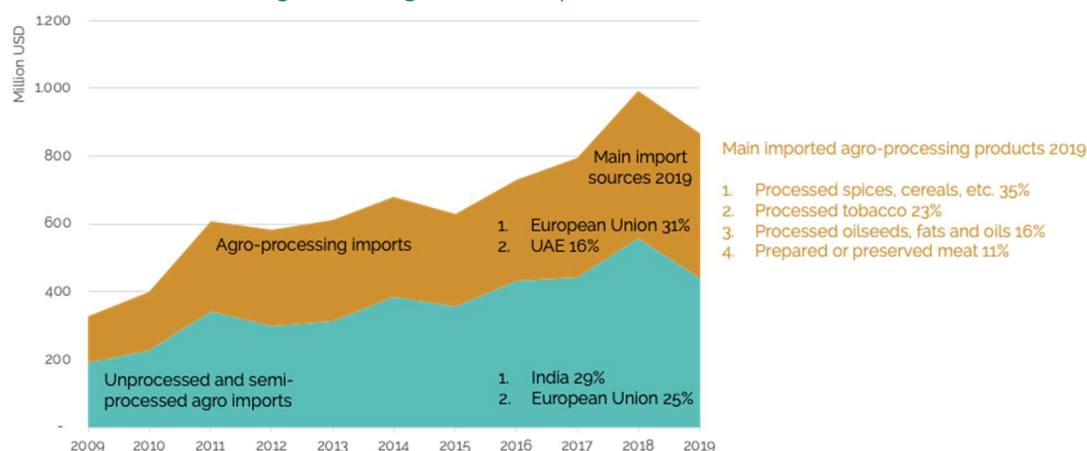
For the Guinean case, the aluminum value chain stands out in this respect. Despite its major bauxite reserves and long track record in the sector, the country has the lowest alumina-to-bauxite refinement ratio of all the major producing countries in the world, while further processing is inexistent in the country.^{xxiv} It is also relevant to highlight that one mining company (SMB) accounts for 53% of bauxite exports in 2019, which increases the vulnerability of the Guinean economy significantly.^{xxv} PNDES 2016–2020 established three possible scenarios for the mining sector: i) The mining sector is completely integrated in the national economy ii) Increased economic dependency on mining iii) Progress is made towards the integration of mining into the economy or iv) Mining is not integrated into the national economy. At the moment of this analysis, the scenario in which the economy is dependent on mining has become the reality. In order to reverse this trend, Guinea's industrial policy will have to take on the challenge of shifting the focus from export orientation towards value addition of mining products. A more selective and strategic approach to investment attraction, the establishment of local content requirements as well as the active creation of the required productive capabilities are some crucial components for the economic transformation of the country.

Agro-processing for the domestic market

Guinea's agro-processing potential is based on the fact that most of its arable land is still unexploited while the agriculture sector absorbs over 60% of total employment. While many opportunities exist in agro-based value addition, public initiatives to promote the development of agro-industrial activities are needed. Today, Guinea is not only lacking access to the regional and international markets for its agro-processing sector, but it is highly dependent on the import of a range of processed food items as well as a range of unprocessed commodities that could potentially be produced domestically.^{xxvi} Agro-processing industries can contribute significantly to GDP growth as they exhibit strong backward linkages that can multiply the effects in the economy and offer a high impact on job creation. Figure 1.21 highlights the large import dependency of Guinea both for unprocessed agricultural commodities as well as agro-processing goods. The import of processed spices and cereals, tobacco, oilseeds, fats and oils as well as prepared and preserved meat account for a large share of these imports. The fact that many of these products are imported from the European Union points to the potential downside of trade liberalization that presents an additional challenge for local producers to serve the domestic market. Some of the constraints for the development of the agro-processing sectors are said to be the lack of support on commercialization of value chains and the limited access to logistics and infrastructure, among others.^{xxvii} The UNIDO Guinea firm level survey 2021 showed that over 40% of the consulted companies were not active in global value chains due to the lack of access to and high price of technology and lack of commercial partnerships. By creating agribusiness processing zones, the government plans to reduce its food trade deficit by 50% by 2050.^{xxviii} However, special attention should be given to the geographical distribution of these zones, as the UNIDO Guinea firm level Survey 2021 found that 40% of the companies classified the location of these zones as a very severe challenge, which prevents them from taking an active part on these newly established projects.

An industrial policy for Guinea should carefully evaluate the potential for import substitution of key agro-processing product groups. Chapter 2 sheds additional light on these potentials.

Figure 1.21. Agro-based imports of Guinea 2009-2019



Source: United Nations UN-COMTRADE (2020) database

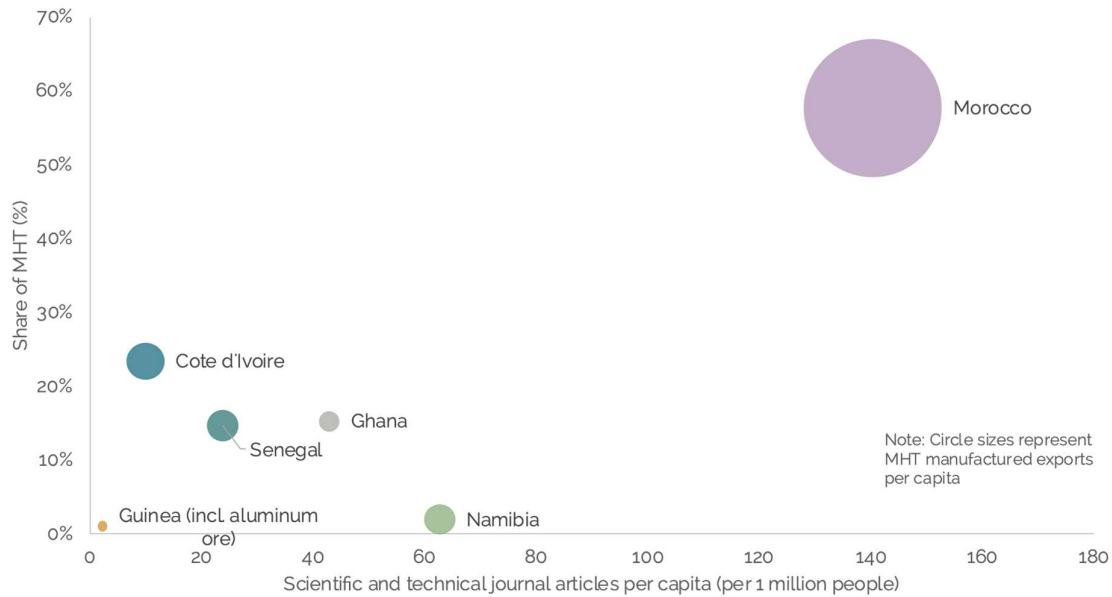
Industrial upgrading and innovation

To date, Guinea largely relies on basic economic activities which generate low value-added and have very limited spillover effects to the economy. These types of unsophisticated products make the economy highly vulnerable to external shocks, such as commodity prices or demand shocks. In particular the extraction of natural resources does not yet offer significant positive linkages to other sectors of the economy. For these reasons, it is important to invest and attract investment that can upgrade the structure of the manufacturing sector towards producing and exporting products with higher technological content in the future. Figure 1.22 highlights the lack of innovative medium and high technology (MHT) activities in Guinean exports in 2018 which is a good proxy to measure the low level of sophistication of Guinea's manufacturing sector. Guinea's share of MHT manufactured exports stands at only 1%, significantly below all benchmark countries. In particular Morocco stands out with a MHT share of 58%, while Cote d'Ivoire can also serve as a role model for industrial upgrading with a MHT share of 23%.

One of the prerequisites for technological upgrading is the development of industrial innovation processes that can provide the foundation for advanced sectors to successfully develop in a country. Figure 1.22 shows that the benchmark countries with stronger innovation performance (proxied by the number of scientific and technical journal articles per capita) are the ones that tend to exhibit a more sophisticated industrial structure, while less innovative countries often fail to enter into medium and high-technology sectors. Guinea has developed the "National Strategy for the Promotion of Intellectual Property" with the mandate to promote investment and technological innovation and support the scientific and intellectual property. It is important that the government continues supporting these initiatives as higher-technology goods tend to have less vulnerability than simple commodities. Furthermore, a structural transformation towards complex production will generate positive linkages such as knowledge spillovers and improve human skills that will benefit the whole society.

Accordingly, the strengthening of productive capabilities and the development of an industrial innovation system should be considered core pillars of an effective industrial policy in Guinea that can lay the foundations for the medium to long term emergence of advanced manufacturing activities in the country.

Figure 1.22. Innovation & MHT exports 2018



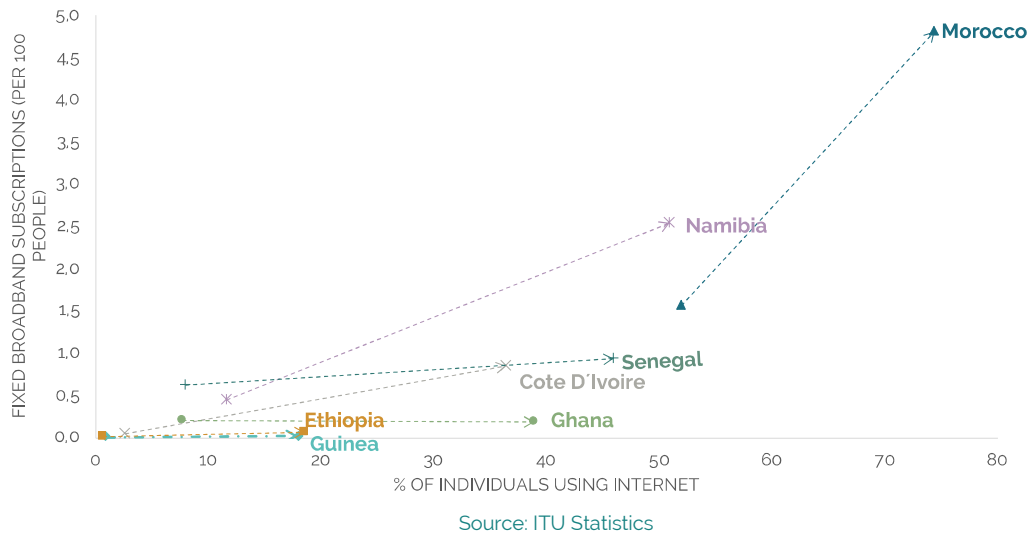
Source: United Nations UN-COMTRADE (2020) database and World Development Indicators (World Bank)

Digital development

As previously mentioned, it is well recognized that in order to develop more technology intensive production and exports in the country, the manufacturing sector needs to develop more sophisticated production processes and products. The idea behind Industry 4.0 is that, in order to increase a country's industrial competitiveness, modern devices and services are essential. Industry 4.0 is the "intersection of the manufacturing sector with smart, digital technology"^{xxix} Figure 1.23 assesses one foundation for digital development by analyzing on the X axis the share of individuals using internet, and on the Y axis the fixed broadband subscriptions per 100 population. It indicates that with respect to the availability and use of digital infrastructure, Guinea is below the performance of all benchmark countries with the exception of Ethiopia and it has not significantly improved its relative position within the period of analysis. Even though in 2010, only 1% of Guinea's population was using internet and in 2019 it increased to 18%, it is still significantly falling behind the other countries. Even more clearly, the rate of fixed broadband subscriptions is still extremely low with 0,01 subscriptions per 100 population. This means that only one in 10,000 people in Guinea has access to high-speed internet, the weakest performance among all benchmarks.

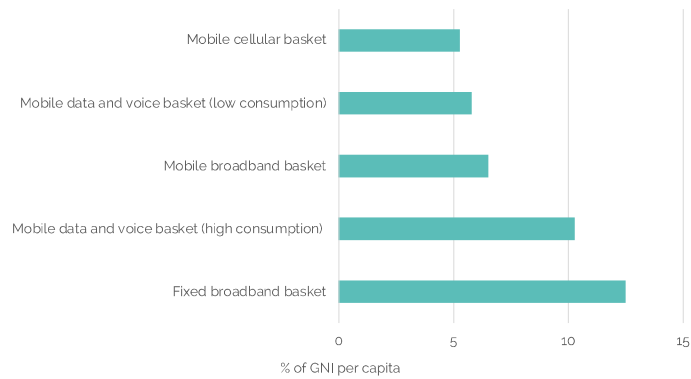
It can be noticed that the outstanding performance of Morocco and Namibia regarding internet use and access mirrors their significant MHT export rates discussed above. If Guinea wants to upgrade its industrial structure in the future, strengthening internet access and connection speed will be one of the preconditions for benefitting from the digitalization of industry.

Figure 1.23. Internet use and access



For a country to adopt Industry 4.0, the basic digital capabilities need to be established. Access and affordability of ICT infrastructure is one of the main prerequisites for digital development.^{xxx} Similarly, the International Communication Union identifies and measures what it is defined as "enablers and barriers" related to prices of the digital infrastructure. Figure 1.24 illustrates the Information and Communication Technology prices as a share of GNI per capita. It indicates that in Guinea the fixed broadband basket service costs on average 12,5% of monthly GNI per capita. The Broadband Commission for Sustainable Development in 2018 has set a target to achieve affordable broadband services that correspond to less than 2% of GNI per capita in 2025.^{xxxix} This indicates that affordability still remains a big challenge in Guinea, and it can explain why the share of fixed broadband subscriptions in the country is extremely low compared to benchmark countries. It can be concluded that, Guinea is still in very early stages of adapting digital technologies and the medium-term introduction of modern manufacturing within the Industry 4.0 spectrum will face significant challenges if the basic digital capabilities are not strengthened.

Figure 1.24. ITC Enablers and Barriers 2019

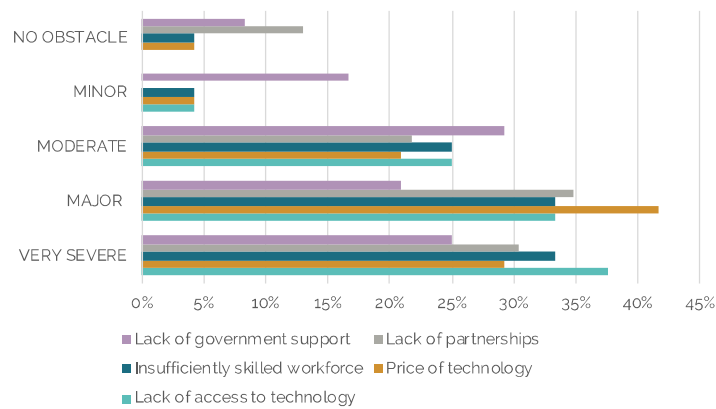


Source: ITU Digital Development Dashboard 2019

BOX 1.1: PERSPECTIVES OF THE PRIVATE SECTOR: INDUSTRY 4.0

Based on the UNIDO Guinea Firm-level Survey 2021, 60% of the consulted companies believe that Industry 4.0 is an important aspect for the future of the economy. However, there is a common understanding that some challenges still exist which are preventing companies from adopting these new technologies as presented in Figure 1-25. The most severe challenges identified by companies are the lack of access to technology (37%) followed by insufficient skill workforce (33%). Lack of commercial partnership as well as the price of the technology also represent issues being faced by the private sector. These challenges are particularly relevant for the manufacturing sector as Industry 4.0 offers a unique opportunity for increasing the country's competitiveness and open opportunities to access new international markets.

Figure 1.25. Main challenges for companies to adopt Industry 4.0 technology



Source: UNIDO Guinea Firm-level Survey 2021

Note: Shares are calculated based on the number of responses (25 answers)

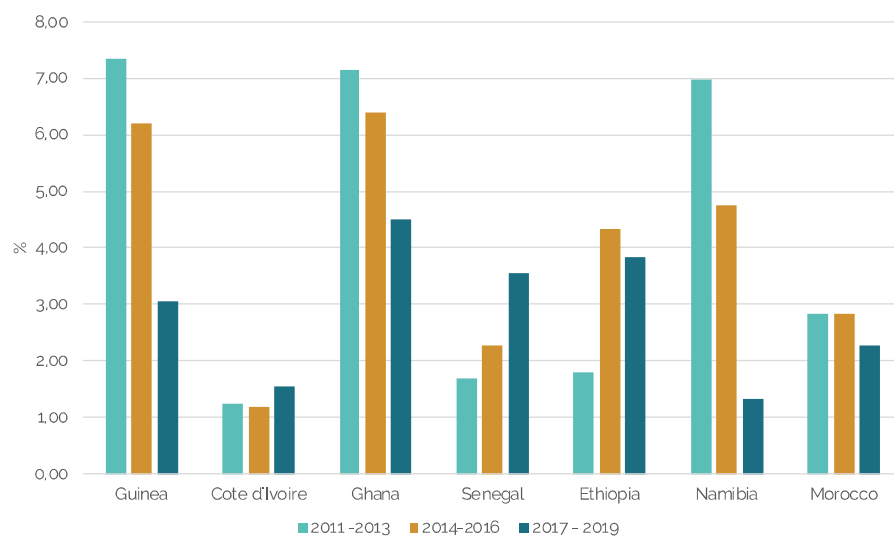
1.2.5. Investment and finance

Investment

The economic growth of Guinea has largely been driven by foreign direct investment in the past. Figure 1-26 shows the average share of FDI in GDP in three recent periods. Overall, the volume of FDI is highly volatile over time and is characterized by individual large investments rather than a large number of regular new investment projects. In the most recent period 2017-2019, the FDI has also been decreasing significantly, representing only 3% of GDP compared to 7% between 2011 and 2013. Compared to the benchmark countries, Guinea's share of FDI in GDP is relatively high and is only exceeded by Ghana, Senegal and Ethiopia in recent years. This can partially be attributed to the governments success in improving the country's investment climate performance through various reforms implemented through the National Investment Program (PNI), e.g. reducing the fees for business incorporation and property fees, etc.

However, unfortunately, the type of investments that is being attracted besides being volatile, is highly concentrated and doesn't focus on the structural transformation laid out in the Vision 2040. Based on the Institut National de la Statistique 2019 yearbook, FDI targets mostly the extractive sector, in particular bauxite mining, which by far exceeds investment into manufacturing activities.^{xxxii} Major investors in the bauxite sector come from China, the Russian Federation, and the United Arab Emirates.^{xxxiii} The very low export taxes on aluminum ore (2%) are currently making mining projects highly profitable for foreign firms, while investments into manufacturing are accordingly seen as less attractive. This analysis suggests, that the industrial policy should consider a more selective and targeted approach to FDI promotion that pays special attention to attracting high quality investors into manufacturing activities that provide larger spillover effects and actively contribute to the transformation of the economy.

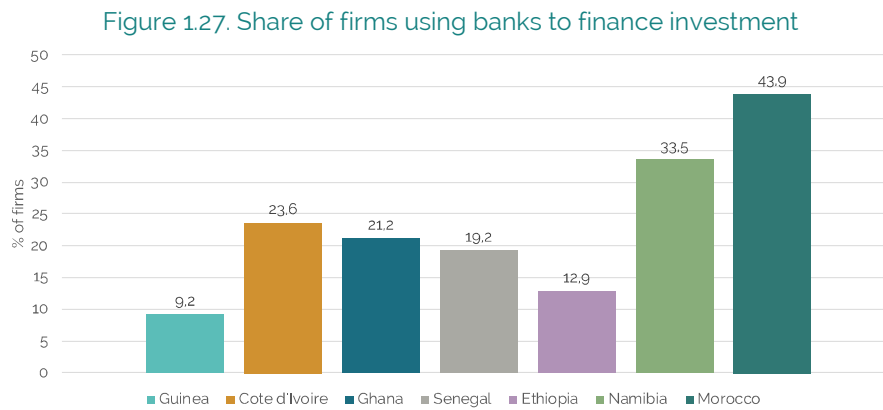
Figure 1.26. FDI as a share of GDP



Source: World Development Indicators (World Bank)

Finance

Access to finance is a challenge in most developing countries and improving the capacities of banks to offer suitable financial products is especially important for countries like Guinea where the number of SME's by far exceeds the small number of large and well-established companies. The share of firms using local banks to finance investment is an indicator of how feasible it is for local companies to access a credit for starting or increasing their operations. In 2016 only 9,2% of companies in Guinea were using banks to finance investment. In contrast, the share of firms in countries like Namibia and Morocco reaches up to 34% and 44% respectively, but also other ECOWAS members show rates that are twice as high as that of Guinea. To improve the access to finance in the country, the Guinean government could explore options to support banks in the expansion of the available financial products.^{xxxiv} Chapter 3 provides a more in-depth analysis of the key bottlenecks for the private sector in Guinea.



Source: World Development Indicators (World Bank)

Note: Data is based on each country's latest year: Guinea, Cote D'Ivoire (2016), Ghana (2013), Senegal (2014), Ethiopia and Namibia (2014), Morocco (2019)

BOX 1.2: IMPACT OF THE COVID 19 PANDEMIC IN THE PRODUCTIVE SECTOR IN GUINEA

Since Guinea’s first COVID-19 case in March 2020, there have been 15,395 confirmed cases in the country up to January 2021. (WHO, 2021) IMF estimates that the real GDP growth rate fell from 5.6 in 2019 to 1.4 in 2020. (IMF, 2020) In the Sub-Saharan region, the World Bank calculates a loss of \$115 billion in output and a decline of economic activity by -3.3%; causing the region’s first recession in 25 years. (World Bank 2020). Due to West Africa’s trade orientation and limited manufacturing capacities, the region’s social-economic development is highly vulnerable to the global pandemic. (AfDB 2020) Guinea, like other countries, is suffering from this pandemic and is not spared its economic consequences.

Private sector and employment impacts:

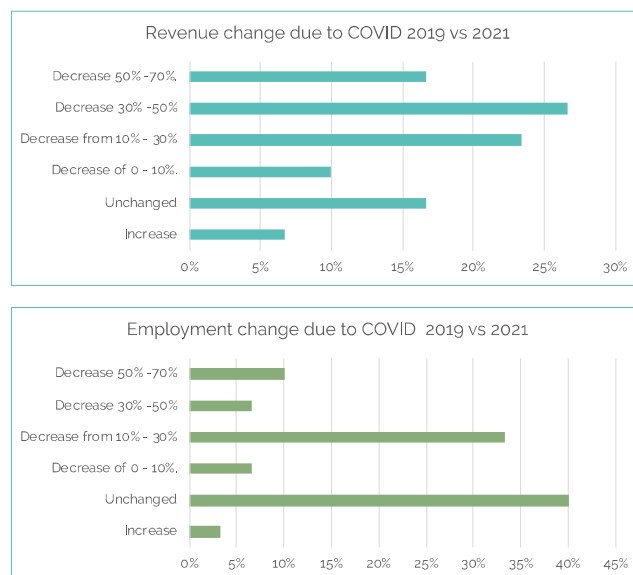
To better understand the impact of the COVID-19 pandemic and design appropriate measures to mitigate the negative effects in the country, the Ministry of Economy and Finance has developed a study. (Ministere De L’economie et Des Finances, 2020) Around 500 formal and informal businesses and over 4,000 households were interviewed. The following findings can support the development of accurate resilience measures:

- Regarding employment and wages, 77% of the household sample reported having paid jobs before the pandemic, while only 50% had a stable income during the pandemic year. This 27% decrease on household incomes, represents a risk for the poverty alleviation efforts in the country.
- Even though SME’s and family businesses are a strong pillar of the Guinean economy, their capacities tend to be fragile against external circumstances such as the COVID-19 crisis. 61% of family businesses reported a significant decrease in income due to transport restriction to move products around the country (21%), closure of establishment due to Covid (20.2%) and lack of costumers (17%)
- The informal sector is also facing major challenges as 38% of the sample reported suffering from the crisis with 10% of companies closed permanently and 27% closed temporarily because of COVID-19. This is particularly difficult in rural areas where more than half of the informal rural business (52%) had to close temporarily or permanently compared to 30% in urban areas. 91% of all informal sector reported a decline in sales and income.
- 81% of formal companies have been negatively affected, 30% of establishments are operating at 25% of the usual rate, 22% are temporarily closed and 4% have permanently stopped activities. Only 5% have managed to continue operating at 100% rate.

The agriculture sector has suffered significantly as virtually all companies had to temporarily suspend their activities. The mining sector is the least affected; 36% of the mining formal sector remains working at 100% capacity while 9% had to cut 50% of operations. The tourism sector is one of the most affected activities globally. In Guinea, 75% of the tourism companies have temporarily closed while 25% have closed permanently. 40% of the transport and logistic companies reported working at 50% capacity and 40% are temporary closed.

Additional information based on the UNIDO firm level Survey 2021 confirms the findings outlined above. Almost 80% of the consulted companies reported revenue decreases, with 26% of them experienced up to 50% of lost and 17% of companies faced a decrease of 10 to 30%. A small share of companies (7%) expressed an increase of revenues. Regarding employment, 56% of companies acknowledge a reduction of jobs. The majority of the affected companies (33%) reduced employment between 10% and 30% which is consistent with the findings of the study developed by the Ministry of Economy and Finance. 40% of the companies did not experience a change in the number of employees.

Figure 1.28. Revenue and Employment change due to COVID



Source: UNIDO Guinea Firm level Survey 2021

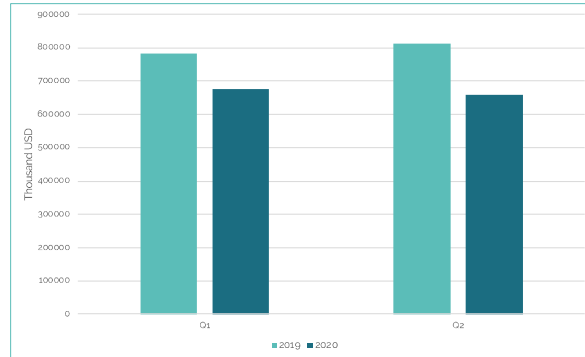
Note: Shares are calculated based on the number of responses (30 answers)

CONTINUATION BOX 1.2: IMPACT OF THE COVID 19 PANDEMIC IN THE PRODUCTIVE SECTOR IN GUINEA

Trade impacts:

Guinea's exports are highly concentrated in a few products and markets, which makes the economy highly vulnerable to external shocks such as the COVID crisis. The mining sector, which is considered Guinea's growth engine, is and could continue to be severely impacted as the demand from the Chinese industry might further decline. In 2019, China imported 72% of Guinea's manufactured exports and 77% of Guinea's aluminum ore exports. Figure 1.29 compares China's aluminum ore imports from Guinea in the first and second quarter in 2019 and 2020. The comparison between the first semesters of 2019 and 2020 indicates that the demand of this product dropped by 14% in the first quarter and by 19% in the second quarter. Considering this trend, it is expected that the mining growth rates will experience a slowdown of 2.8% for the target of 8.3%. (Ministere De L'economie et Des Finances 2019)

Figure 1.29. China Imports of Aluminium Ore from Guinea Q1 & Q2 2019 vs 2020



Source: ITC Trade Maps 2021

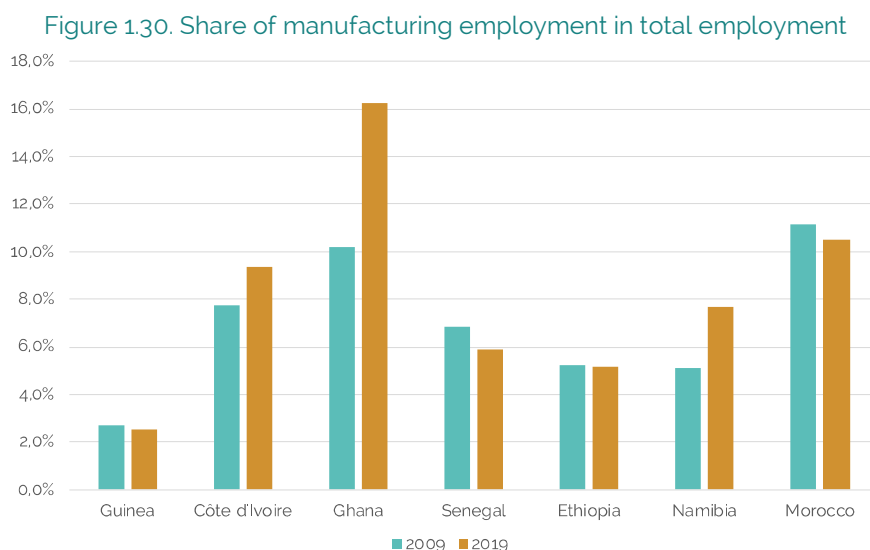
Government support to the private sector:

The government has developed an economic response plan to protect the national economy and assist the private sector to absorb the impacts brought by the crisis. The plan is composed by thirty key measures. Some of the measures already welcomed by the private sector include, the reduction of financial tax and burdens for the most affected sectors, guarantee mechanisms for bank loans to SMEs and deferral of water and electricity bills by three months. Based on the World Bank Covid 19 Business Pulse Survey, conducted in June 2020, 23% of the sample expressed having applied to the government's support but have not received it, however 54% of companies reported not being aware of the public support programs. (IFC, 2020)

1.3. Social performance

1.3.1. Manufacturing employment

Structural change is understood as the process in which labor and other resources move from agriculture towards activities with higher value added, such as manufacturing.^{xxxv} Figure 1.30 illustrates the share of manufacturing employment in total employment by country in 2009 and 2019. Besides presenting the lowest levels of manufacturing employment among benchmark countries, Guinea has slightly decreased its share from 2,7% to 2,5% in 2019. This mirrors the decline of the share of MVA in GDP, which experienced similar levels of decrease in the same period. Lessons can be learned from Ghana, which has managed to increase its manufacturing employment from 10% up to 16% with a compound annual growth rate of 7%. Ghana's Industrial Policy makes the promotion of productive employment in the manufacturing sector a priority. Under this objective, the government has established a list of strategies such as increase the skilled labor supply, technological capacity building to increase productivity, and technical manpower for key industrial sub sectors.^{xxxvi}



Data Source: ILOSTAT.

Under pillar 2 of the PNDES 2006 – 2020 the government aims to promote a sustainable, competitive industry that creates productive employment. Part of the expected "effects" is to increase the contribution of the manufacturing industry to job creation to 13% in 2020. Bases on ILO statistics estimations, it is unlikely that this target can be achieved any time soon. It is worth noting that, given the high rates of informal sector in the country, the real impact of the manufacturing SMEs employment generation might be underestimated. Generally speaking, salaried workers only represent 8,5% of the workforce and the informal sector accounts for 42% of GDP. A survey developed by the government in 2016 found that 92% of private businesses are informal micro enterprises, employing fewer than five people.^{xxxvii} Efforts must be made to formalize this sector's workforce. Informal sector employment is characterized by very low levels of quality, e.g. by being subjected to low wages and precarious conditions. The lack of economic diversification is also a challenge for increasing the employment in the manufacturing sector, for example through the

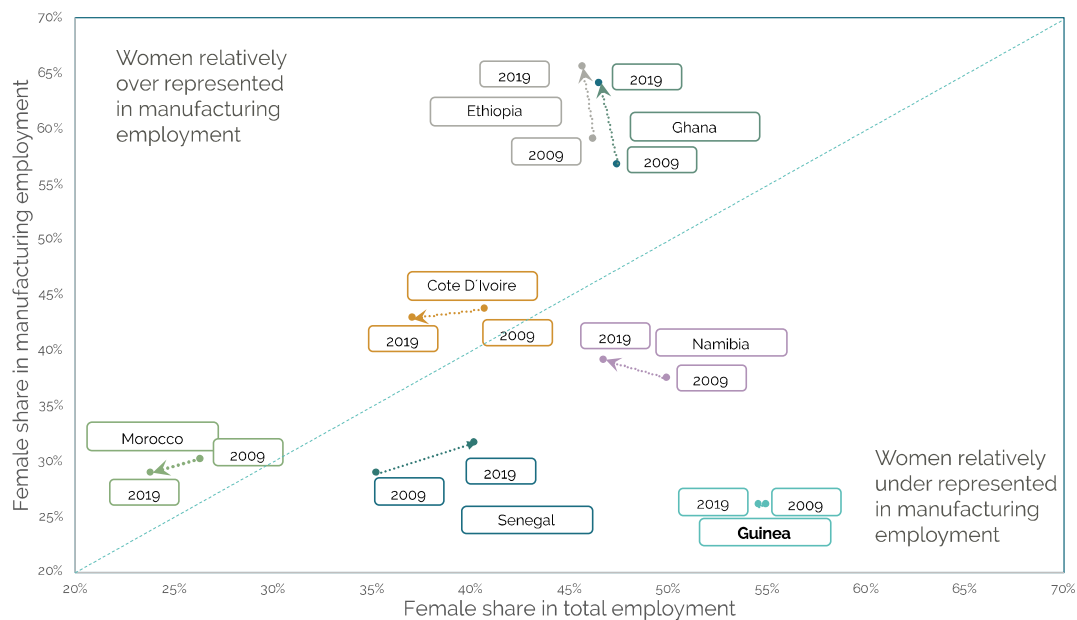
promotion of the agro-industries with strong backward linkages. The government is planning to create industry clusters, specifically agribusiness processing zones. Industrial spatial projects if correctly developed, can create manufacturing jobs, nevertheless, it is important to consider regional integration and avoid the regional concentration of the projects. Agro-processing zones should be developed in areas where besides being economically feasible, can also absorb workers from rural areas.

1.3.2. Youth and gender

Female share of employment in manufacturing

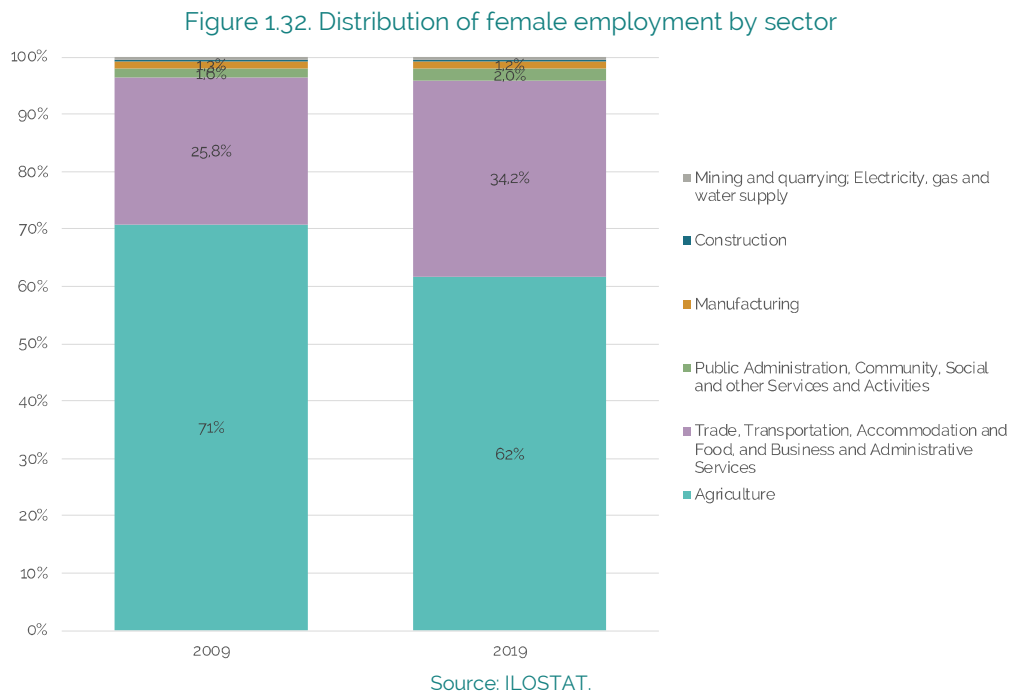
Through Pillar 3 "Inclusive Development of Human Capital" the PNDES seeks to ensure a decent employment and promote social inclusion of vulnerable groups. Figure 1.31 illustrates the share of female employment in the manufacturing sector and total employment in 2009 and 2019. Guinea shows the lowest share of female presence in the manufacturing sector among benchmark countries with only 26%. While countries like Ethiopia (59%), Ghana (64%) have experienced a slight decrease on the share of female in total employment, the presence of women in manufacturing sector has increased significantly. Although Guinea's share of females in total employment (55%) is the highest among competitor countries, manufacturing employment has maintained at the exact same level in over a decade. In 2018, the government undertook a series of initiative to empower women and young females. Through the *Boosting Skills for Youth Employability program*, women are trained and offered internship opportunities in the productive sector, specifically for agro-poles and mining clusters. To promote women's entrepreneurship, the government has established the *Women's Empowerment and Promotion Centers* for supporting woman to access finance and business and technology trainings.^{xxxviii}

Figure 1.31. Female share in manufacturing and total employment



Source: ILOSTAT.

Figure 1.32 shows the share of female workforce by sector of the economy. Agriculture offers most of the opportunities for the female population even though it has decreased modestly during the last decade. Currently, 62% of the total female workers dedicate to agriculture while services represent the 34%, public administration 2% and manufacturing only 1%. The lack of opportunities of woman in the manufacturing sector is a constrain for the economy as a whole. Research shows that the quickest way to reduce poverty is to empower woman. Access to income and decent employment can multiply the economy, as women are more likely to invest in their children schooling, food security and tend to invest in their communities. It is important to identify the sector within manufacturing that have the potential to absorb female labor and offer decent salaries. Parallely the government must continue empowerment programs though technical trainings, entrepreneurship guidance, access to finance, etc.

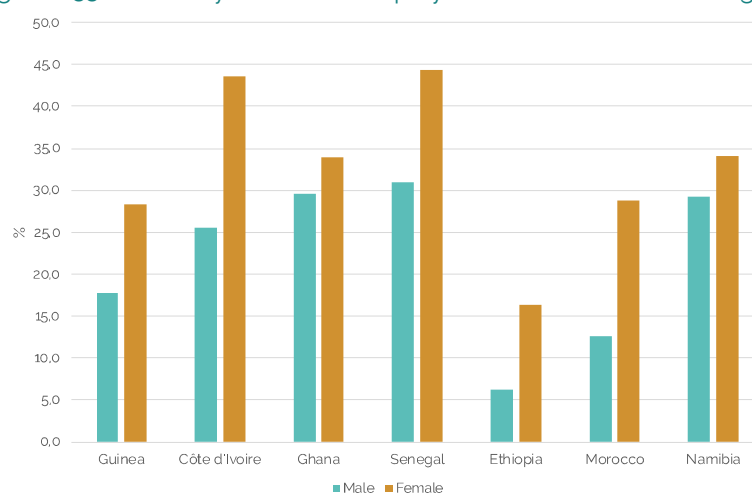


Share of youth not in employment, education or training

In 2019, 23% of Guinea's youth were not employed nor involved in any education or training activities. There is also a gender discrepancy, 28,03% of female youth do not have access to these activities compared to 17,7% to their male peers (Figure 1.33). 60% of the population in Guinea is under the age of 24, which means a huge potential for the country to generate a demographic dividend if supported with strong employment and educational policies. ^{xxxix} Compared to benchmark countries, Guinea, Morocco and Ethiopia show the lowest levels of this indicators nevertheless the shares are still weak. The government acknowledges the problematic situation.

Through the National Youth Employment Policy (PONEJ), the government aims to achieve “full employment and poverty reduction by offering rural and urban youth aged 15 to 35 years old, opportunities for skills training to improve their employability and productive, salaried, self-employment, and empowerment through their access to credit through microfinance institutions”. Efforts have been made to achieve the PNDES 2016 – 2020 targets of reducing the rate of out-of-school and unemployed youth. In 2018 the government established the Local Youth Councils to promote the participation of young population in governance in conflict prone communities. For young girls specifically, the program has developed advocacy and leadership training and provision of computer equipment. Likewise, the government has developed infrastructure improvements for educational, sports and cultural centers for youth. ^{xl}

Figure 1.33. Share of youth not in employment, education or training by sex (%) 2019



Data Source: ILOSTAT.

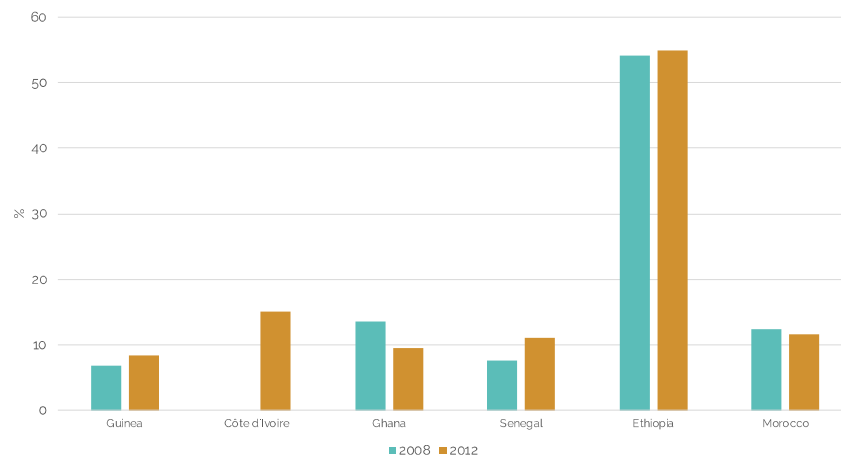
1.3.3. Education & Skills

One of the key drivers of economic productivity is the level of education of the labor force. The higher the level of education of workers, the faster the structural transformation of the economy can be achieved. Based on national statistics, the primary school enrollment in 2019 was 84,1% while secondary completion rate was only 18,2% in the same year. The government has made great effort to improve the quality of education in the country, nevertheless it acknowledges that many challenges still remain. From one side, due to the lack of resources and inadequate infrastructure, there is a mismatch between school supply and demand, with a share of the population being left out. The resource allocation for the education system in the region is around 4,5% of GDP on average, while in Guinea is around 3,7%. The lack of state supported scholarships for higher education represent a challenge for students, in 2018, 807 students per 100,000 inhabitants were involved in higher education while in 2019 it went down to 709. There is also a shortage of teachers and the resources available are very limited. ^{xli}

Often, unemployment policies fail to tackle constraints that affect specifically the young population. For example, most graduates suffer from lack of experience and understanding of the labor market. This challenges massively their capacities to fit in an already very competitive labor market.^{xlii} Vocational trainings offer students the opportunity to "learn while doing", expand professional contacts and earn an income. Figure 1.34 shows the share of students in secondary education involved in vocational programs. In 2008, 6.8% of students in Guinea were part of a vocational training and 8.3% in 2012. While the ECOWAS members also experience a very low level of vocational training enrollment, Ethiopia shows a share of over 50%. The Ethiopian government believes low productivity is due to the skill gap among workers, therefore the *Technical and Vocational Education and Training (TVET)* program was developed. This public program aims to support the capacity development of students in order to increase enterprise productivity and their competitiveness in global markets. The Ministry of Education in Ethiopia periodically tests students and decides whether a student must continue with traditional education or should be part of the TVET program. In Guinea, through the "Letter of Policy for the Development of Technical Education and Vocational Training (ETFP)" the government is strengthening the vocational training system. Among the activities envisioned under the policy, are to deliver capacity building to public institutions and leaders within the vocational program, infrastructure development and diversification of the vocational training options.

For students leaving / graduating from the program a database has been developed by the Guinean Agency for the Promotion of Employment (AGUIPE) to connect the job seekers with the demands. Last but not least, to promote the manufacturing employment in the young population the government expects to fund a program for development of apprenticeship in the urban handicrafts sector and in the metal assembly manufacturing sector.^{xliii}

Figure 1.34. Share of all students in upper secondary education enrolled in vocational programmes (%)



Data Source: UNICEF

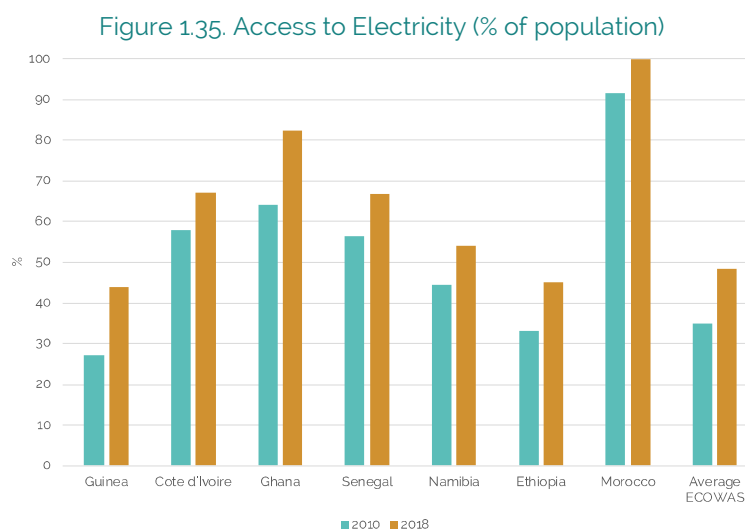
1.4. Energy and environmental performance

1.4.1. Energy

The government of Guinea has developed the “Letter of Development Policy of the Energy Sector”, and established within Pillar 3 of the PNDES the objective “*to improve access to energy, drinking water and a decent living environment in urban and rural areas*”. To achieve this goal, two strategic lines of action have been identified. On the one hand, to increase the number of people who have **access to diverse energy sources**, which are healthy and financially accessible. On the other hand, to reduce the dependence on fossil fuels through diversification of the energy mix towards **renewables sources** and increased **energy efficiency**.

Access to electricity

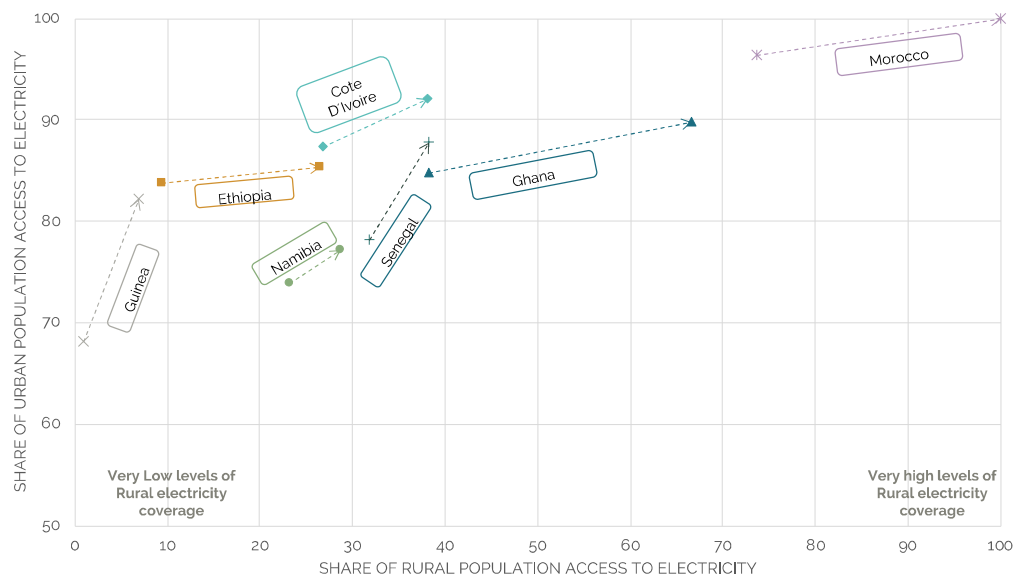
Access to energy is at the core of any country’s economic development. For this reason, the SDG 7 aims to “ensure universal access to affordable, reliable and modern energy for all”^{xliv} In Guinea, access to electricity is one of the main bottlenecks for business development (See Chapter 3). In 2018, less than half of the population in Guinea had access to electricity (44%) nonetheless, it has slightly improved as in 2010 the share of electricity coverage was only 27.3% of the population (Figure 1.35). Considering the energy potential of the country, the performance is still weak. While the ECOWAS Average in 2018 was 48.5%, countries like Ghana or Morocco cover between 80% and 100% of their population with electricity. The government expected to achieve a coverage share of 35% in 2020, hence the targets under this objective has been already achieved in 2018.



Source: World Development Indicators (World Bank)

Nevertheless, efforts must continue as the access to electricity is not only important for social development but it's the basis for industrial development. Furthermore, the lack of equal electricity distribution in the country can create regional development imbalances. Figure 1.36 illustrates in the X axis the share of electricity access of rural population while Y axis shows the share of electricity access of urban population for 2008 and 2016. Guinea presents the most unequal distribution of electricity and a very limited improvement in the period of analysis. In 2008 only 0,98% of the rural population had access and in 2016 went discreetly up to 6,90%. More industrialized countries like Morocco for example have achieved to provide electricity to 100% of rural and urban population. This facilitates the creation and upgrading of manufacturing enterprises all over the country.

Figure 1.36. Change in the access to electricity in rural and urban population 2008 - 2016

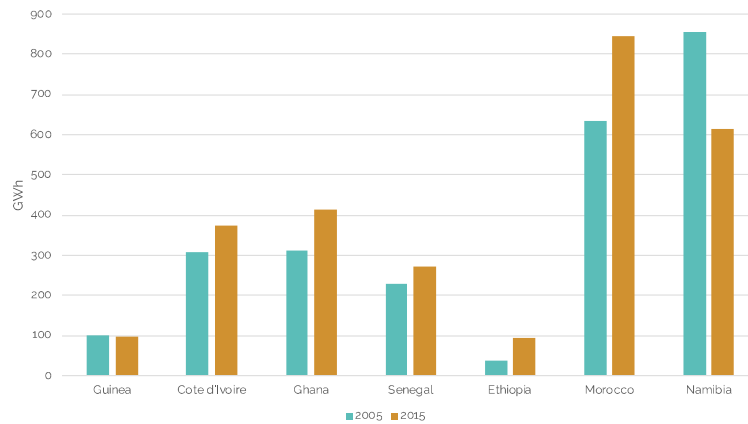


Source: World Development Indicators (World Bank)

Electricity production capacity

Electricity output per capita indicates the country's capacity to produce energy for its population. Figure 1.37 shows that, even though in the latest years the energy sector has been a source of foreign investment attraction, the production has actually slightly decreased. Per one million population, the country has managed to produce 97.7 GWh. This level is the lowest compared to peer countries, only ahead of Ethiopia. A successful industrialization process will require a significant expansion of the energy production capacity of Guinea, which is illustrated by the electricity output of benchmark countries which is up to 8 times higher on a per capita basis than that of Guinea. However, the Souapiti Hydroelectric Development and Kapeta plant have been established with a potential capacity of 1000 MW. This mega project is expected to double Guinea's energy supply in the near future. ^{xlv}Another relevant issue to consider is the cost of electricity, which represents a key bottleneck for manufacturing companies in the country. More information on this regard can be found in section 3.

Figure 1.37. Total electricity output per 1 million population (GWh)

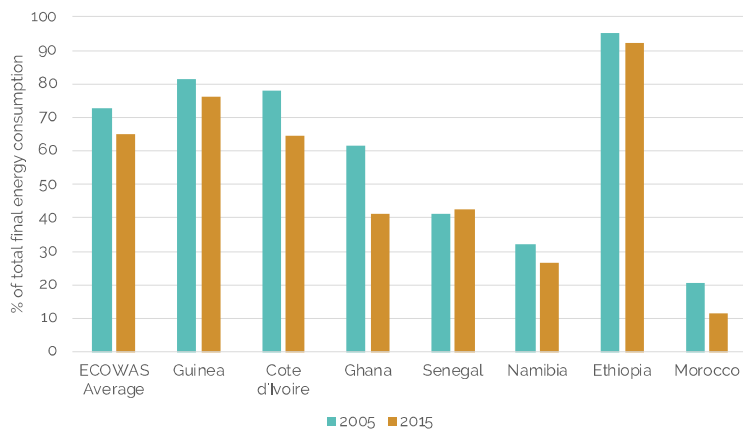


Source: World Development Indicators (World Bank)

Renewable energy

Increasing the share of renewable energy consumption is a priority on the international development agenda (SDG 7)^{xlvi}. Countries are therefore focusing efforts to move towards new and clean energy technologies. Figure 1.38 shows the share of renewable energy consumption in total final consumption. Guinea has slightly decreased its share from 81% in 2005 to 76% in 2015. This is still higher than the ECOWAS Average in 2015 of 64%.⁶

Figure 1.38. Renewable energy consumption (% of total final energy consumption) 2005-2015

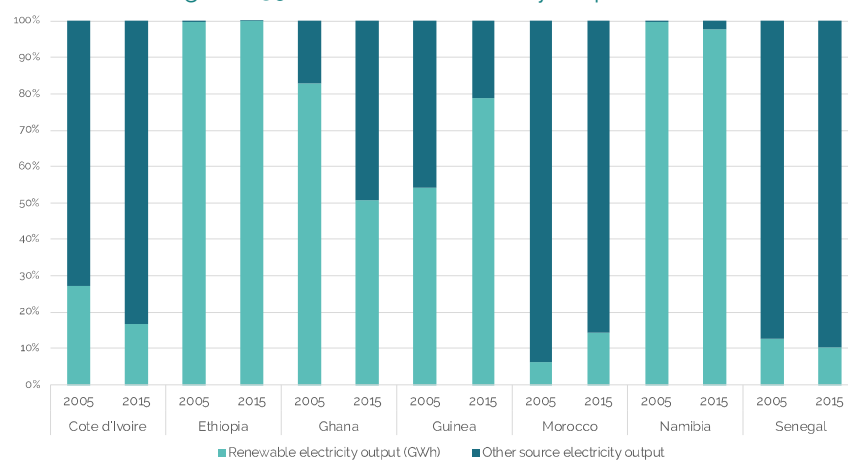


Source: World Development Indicators (World Bank)

⁶ This indicator of renewable energy includes biomass that does not necessarily represent a modern form of energy provision.

Guinea’s potential for renewable energy production particularly hydroelectricity is around 26,000 GWh/year^{xlvii}. The government estimates additional capacity between 535 and 1828MW will be necessary by 2025.^{xlviii} Figure 1.39 illustrate the share of electricity output by renewable sources and non-renewable sources. It indicates that Guinea has considerably increased the production of renewable sources. Between 2000 and 2014 most of the renewable electricity output was charcoal based⁷. Since 2015 onwards, a reduction of charcoal production and an increase of hydroelectricity can be appreciated.^{xlix} The government of Guinea is aware of the hydro potential, since the country enjoys of one of the largest water reserves in the region. In 2012 the hydroelectric capacity was 225MW^l meaning, the resource is yet hugely unexploited. Nowadays, various projects have been developed and many more are under construction.^{li}

Figure 1.39. Renewable electricity output (GWh)



Source: World Development Indicators (World Bank)

Energy and waste in the aluminum industry

The future structural transformation of the Guinean economy will require a substantial amount of energy. As analyzed in the previous section (export diversification) the country must expand its production capacities, upgrade existing industries and create new value addition activities. The main economic potentials lay in adding value to mining products and agro-processing sectors. The mining industry offers a great opportunity for value addition. Currently, only a very small portion of the resources are being processed in the country; 99% of bauxite is being exported in its raw form. In order to encourage companies to build alumina refineries and aluminum smelters, the country will need to ensure access and quality of electricity, as these sectors consume large amounts of energy. It is important to be aware of the challenges and possible negative environmental impacts that the aluminum industry can bring (Table 1.1). The amount of electricity required for alumina refining is 30 times higher than what is required for mining (150 kWh per ton vs. 5 kWh per ton), while aluminum smelting requires almost 100 times more energy than the

⁷ Based on the IEA: Due to its widespread use in developing countries for heating and cooking, solid biofuels/charcoal is by far the largest renewable energy source, and the second largest source is hydro.

refining process (14,000 kWh per ton). A case worth mentioning is the Mozal smelter in Mozambique. Mozambique possesses 680 MW installed energy capacity,^{lii} but the Mozal smelter requires about 1000 MW of electricity, which is being imported from South Africa.^{liii}

Table 1.1 Environmental Impacts of Bauxite Industry

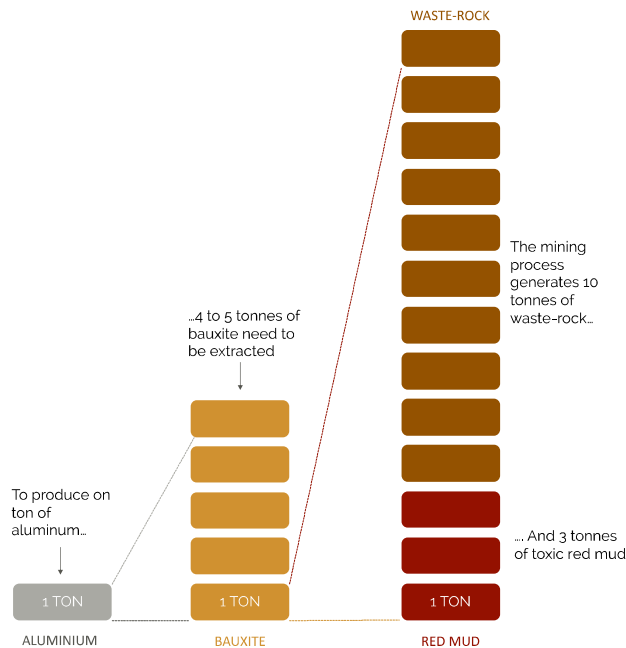
	Bauxite mining (per t of bauxite ore extracted)	Alumina refining (per t of alumina refined)	Aluminium smelting (per t of primary aluminium smelted)
Fuel Input	1.5 kg	100 kg	
Electricity input	5 kWh	150 kWh	14,000 kWh
Water input	0.6 m3	8 m3	Around 20 m3
Waste output	0.00095 t dust	1 - 1.5 t	0.05 t

Source: Widder et al 2019 Sustainably Growing Guineas Bauxite aluminium industry

The Ministry of Energy is aware of the need of increasing energy production in order to not only transform bauxite, but increase manufacturing production and global competitiveness.^{liv} There is hope that the Souapiti Hydroelectric Development project will support this transition. Hydroelectricity is among the most common types of renewable energy in developing countries^{lv} and may be used to leapfrog the negative impacts of the aluminum industry. Nevertheless, hydropower projects can also have negative impact on the long term, for instance, dams can reduce quantity and quality of water, and if not assessed properly it can cause loss of biodiversity. More recently discussions also focus on the long-term viability of hydropower plants as due to climate change a reduction of rainfall could make the dam projects obsolete.^{lvi}

Another environmental challenge for the aluminum industry relates to waste generation. Figure 1.40 illustrates that, in order to produce 1 ton of aluminum, 4 to 5 tonnes of bauxite need to be extracted which in turn will create around 10 tonnes of waste rock and 3 tonnes of red mud. Red mud has been proven to be toxic for surrounding communities and has significant environmental consequences. The organization Human Rights Watch reported in 2018 that the red mud generated by some mining companies was heavily affecting the local populations' water sources. The report also exposes the need for companies to prove accountability by monitoring the waste management procedures and water quality control.^{lvii}

Figure 1.40. Mining waste generated from aluminium production



Source: GRIDA UNEP - European Aluminum Association

The government is also aware that institutional strengthening is key to apply regulatory requirements in terms of environmental impact assessments in both energy and bauxite projects. Some of the most relevant legal frameworks are the Environment Code (1987), the Water Code (1994), the Wildlife Protection Code and Hunting Regulations (1997), the Forestry Code (1999) and the Mining Code adopted in 2011 and

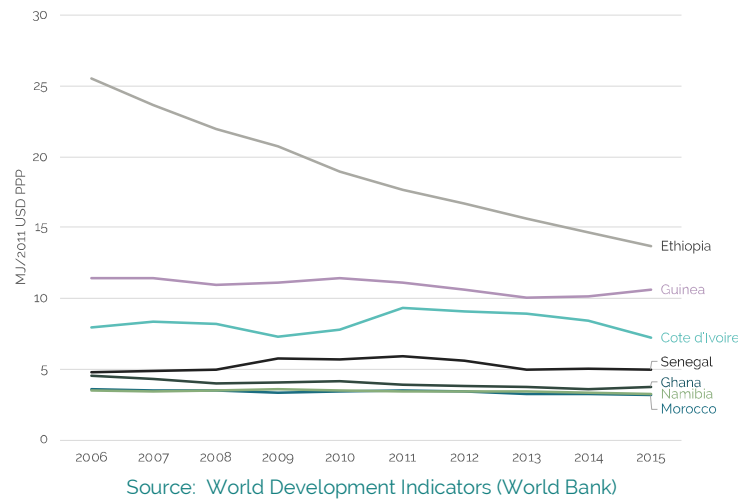
revised in 2013. Guinea has ratified a number of environmental international specially the 2030 Agenda for Sustainable Development.^{lviii} At the institutional level, the country has several structures created for environmental protection. In addition, there are two funds dedicated to the environmental sector: the National Forestry Fund and the Environmental Protection Fund. The existence of all these structures demonstrates Guinea's determination to make the preservation of the environment one of its priorities. However, the implementation of these environmental protection instruments is confronted with the lack of statistics. Many of the data is not up to date due to the lack of technical capacity and the complexity of the environmental field.^{lix}

Energy intensity

Due to lack of statistics, it is challenging to assess the energy efficiency of the manufacturing sector, therefore this analysis focuses on the macroeconomic level. Figure 1.41 shows the level of energy intensity of primary energy. Primary energy can be any type of form that is used to produce electricity, for example it can come from fossil fuel or renewable sources. It indicates how much energy is used to produce one unit of economic

output (in USD PPP), the lower the ratio, the more energy efficient the economy is. For every 1 USD produced in the Guinean economy, it requires 10,6 MJ. From 2006 to 2015 the efficiency has increased, as the amount of energy required for every USD has decreased with a compound annual growth rate was -0,8%. Nevertheless, the performance is still bellow most of the benchmark countries. Even though Ethiopia shows the lowest levels of energy efficiency, it has reduced its energy requirement by -6,8%.

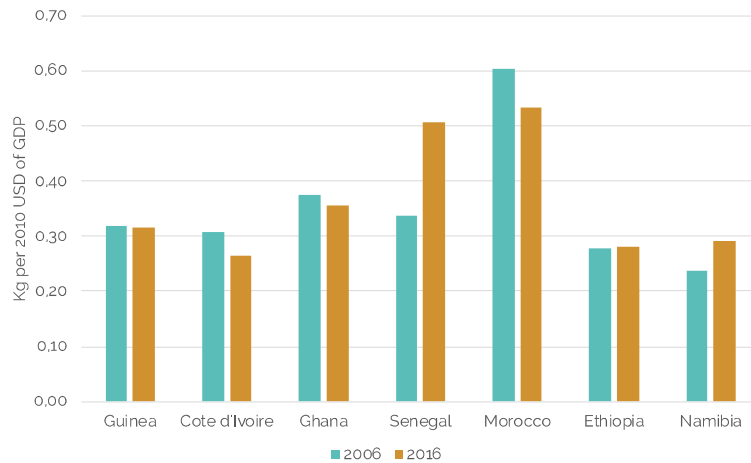
Figure 1.41. Energy intensity level of primary energy (MJ/2011 USD PPP)



1.4.2. Cleaner production

Under Pillar 4 of the PNDES 2016-2020, the government aims to achieve a reduction of Greenhouse gas (GHG). Figure 1.42 shows the CO₂ emissions generated for every USD\$ of GDP. In one decade (2006 – 2016) Guinea has managed to reduced only 0,1% of its CO₂ emissions based on this indicator. Nevertheless, it is worth mentioning that these levels are still relatively low compared to other countries. In 2006, 0,3 Kg of CO₂ was emitted per every USD\$ of GDP while in 2016 it took 0,31 Kg of CO₂ per one USD\$ of GDP. Considering the fact that Guinea’s industrial sector it is still at an infant stage, these levels can increase proportional if not tackle quickly. The PNDES selected a list of priority actions to reduce CO₂ emissions. Among those actions are to strengthen the national capacities to combat climate change; by for example dissemination of technical knowledge, improvement of the charcoal producers ‘capacities to improve the quality of the materials, promotion of climate-resilience innovation and best practices among others. Parallely, the government has promotion of clean energy technologies for industries and households.

Figure 1.42. CO2 Emission (Kg per 2010 USD of GDP)

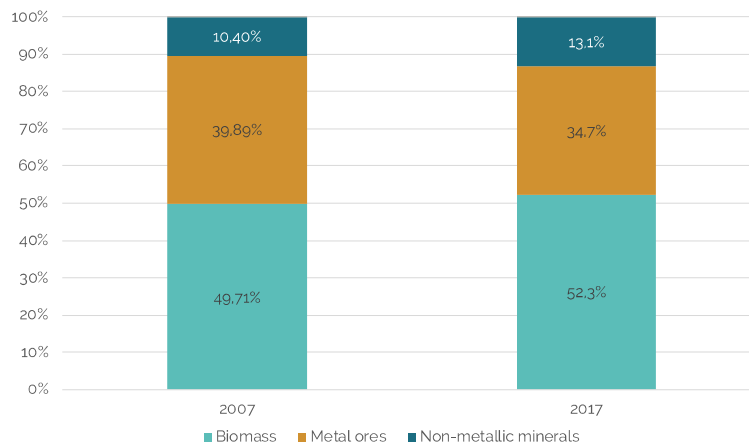


Source: World Development Indicators (World Bank)

Resource efficiency

Guinea's is a privileged country with various natural resources endowments that could provide plenty of economic and social benefits. However, the country's high dependency on a few materials can have long-term negative impact in both the economy and the environment. Between 1970 and 2013, the domestic material extraction in Guinea increased by 319,3%.^{lx} Figure 1.43 illustrates the share of domestic extraction by material in 2007 and 2017. Biomass had the largest share of material extraction in 2017 (52,3%) followed by Metal ores (34,7%) and Non-metallic minerals (13,1%). These shares do not show any visible change in the period of analysis.

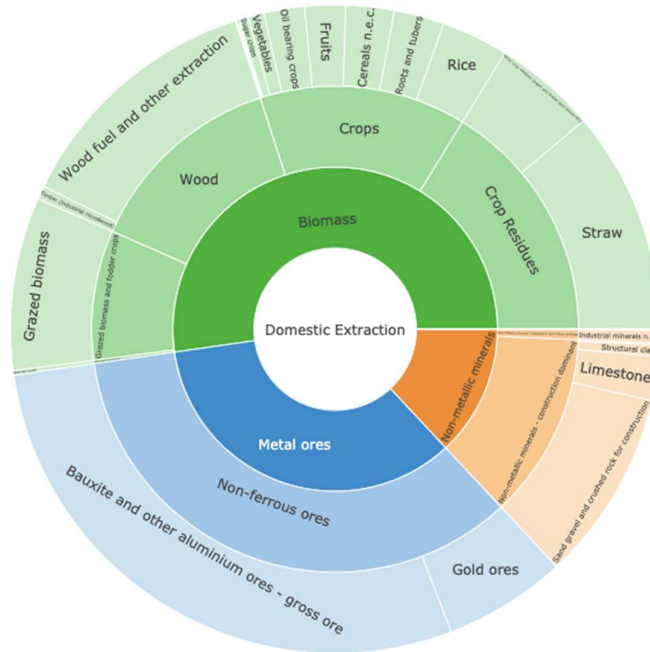
Figure 1.43. Share of Material Extraction



Source: WU Vienna (2019): Country Profile for Guinea. Visualisations based upon the UN IRP Global Material Flows Database. Vienna University of Economics and Business.

Figure 1.44 presents the main components of each material extraction. Biomass material accounts for grazed biomass, wood, crops (fruits, vegetables, cereals, rice, etc) and crop residues such as straw. The majority of metal ores are attributed to bauxite and other aluminum ores and a smaller part, gold. This concurs with the main findings on the export diversification dimension. Last, non-metallic minerals are dominated by construction material such as limestone and sand gravel and crushed rock for construction.

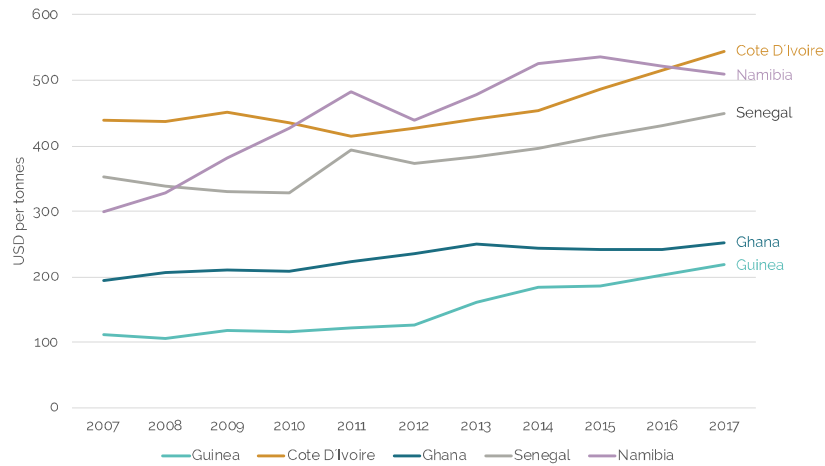
Figure 1.44. Material Extraction in Guinea 2017



Source: WU Vienna (2019): Country Profile for Guinea. Visualisations based upon the UN IRP Global Material Flows Database. Vienna University of Economics and Business.

Increasing the material efficiency at both, national level and sectorial level can support the country to move the economy from resource-intensive activities towards higher-value added production methods. It also improves the competitiveness of the manufacturing sector by promoting technological enhancement and cost-cutting strategies. Resource efficiency indicates how much value (in USD for example) is being generated per unit of material input.^{lxii} Figure 1.45 illustrates the material efficiency from 2007 to 2017 by setting GDP in relation to the Domestic Material Consumption (DMC). DMC reflects the amount of materials that are used within the national borders of the economy. Among the benchmark countries, Guinea’s material usage is the least efficient as it shows the lowest values (218,8 USD\$ per ton of material in 2017). The highest material efficiency is Cote D’Ivoire with 545,5 USD\$ per ton of material followed by Namibia and Senegal. Even though Guinea’s efficiency levels are comparably low, it is worth mentioning an increase in efficiency can be seen, especially from 2012 onwards. Between 2007 and 2017 its compound annual growth rate was 7%.

Figure 1.45. Material Efficiency

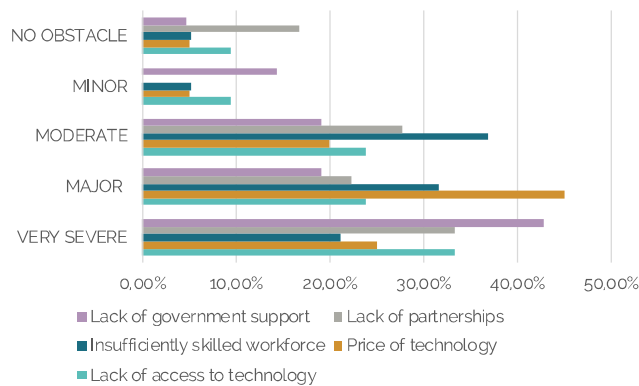


Source: WU Vienna (2019): Country Profile for Guinea. Visualizations based on UN IRP Global Material Flows Database and World Development Indicators (World Bank)

BOX 1.3: PERSPECTIVES OF THE PRIVATE SECTOR: CIRCULAR ECONOMY

Almost half of the companies consulted through UNIDO Guinea Firm level Survey 2021 expressed that Circular Economy is very important for the future of Guinea's economy yet the sector still faces various challenges. Figure 1.46 illustrates that over 40% of the companies agreed that the lack of government support is a very severe barrier for the private sector to move towards greener activities. Likewise, the high prices of technology, lack of partnership and lack of skilled workforce are classified as major challenges. An industrial policy that focuses on promoting Circular Economy can offer manufacturing companies several incentives and schemes, such as tax reduction or interest free loans for investment in machinery and processes to green the existing industries and create new green industries.

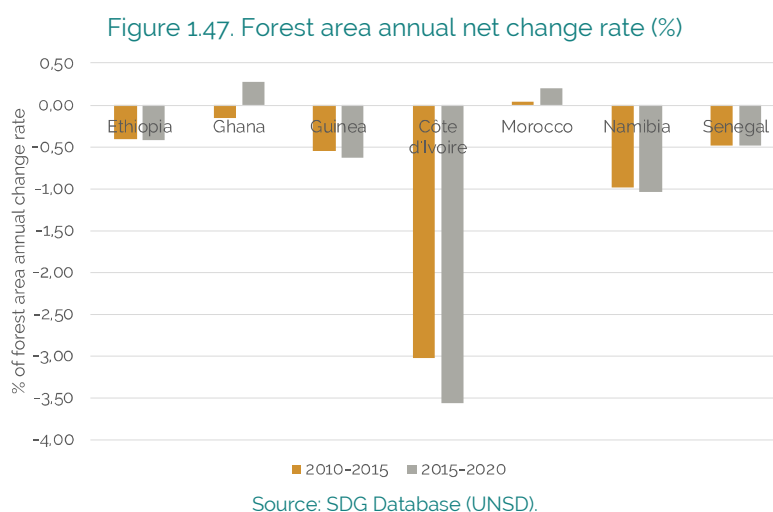
Figure 1.46. Main challenges for companies to implement Circular Economy activities



Note: Shares are calculated based on the number of responses (22 answers)
Source: UNIDO Guinea Firm level Survey 2021

1.4.3. Forest area

Guinea's forest covers around 54% of the national territory. It has more than 20 natural protected areas. Guinea's forest is home to rich variety of wildlife, including a variety species including insects, mammals, birds, reptiles and amphibians.^{lxii} There are many reasons why protecting the forest from deforestation is relevant for a country such as Guinea. First because of the pressure on forest resources that implies the household's high charcoal dependency, second forest resources also represent a big income generation for populations and third, agriculture activities are the main provider of employment in the country, which can cause farmers to deforest in order to increase the arable land. Figure 1.47 shows that the forest annual change rate in Guinea between 2010 and 2015 was -0.55% and it has slightly decreased between 2015 and 2020 to -0.63%. The government has established legal institutional frameworks and regulatory systems to ensure the protection of forest land such as the establishment and dissemination of the Forestry Code.



1.5. Summary of section 1 and implications for the industrial policy project

The findings in this chapter reveal that Guinea's industrial sector is still at an infant stage but with a vast potential for future growth. The industrial sector has a significant contribution to GDP, however this is largely driven by the mining sector, while most manufacturing activities are resource-based and highly concentrated on basic levels of processing. The manufacturing sector is dominated by SMEs and shows particularly high rates of informality. The agriculture sector remains the largest source of employment, while the tertiary sector contributes considerably to value generation. The mining sector plays an extraordinary role in the country and as expressed in PNDES 2016-2020, could offer big potential for the creation of forward linkages into the manufacturing sector. However, despite Guinea's long bauxite mining, only one alumina refinery has been established, while smelters and final processing are inexistent. In a nutshell, the transformation of the economy through processing of natural resources has not yet been initiated.

Guinea's economy is highly exposed to externalities due to the fact that the export share in GDP was 56% in 2019, significantly higher than all benchmark countries. At the same time,

exports of aluminum ore and gold amount to 94% of total exports, while manufacturing products only contributed to 3% of total exports. In addition to this heavy concentration, the analysis reveals that 99% of Guinea's metal exports are unprocessed, while other ECOWAS countries have made more progress in transforming their raw materials. Likewise, Guinea's exports are only absorbed by a very limited number of markets, as the top 5 destinations concentrated up to 90% of the manufactured exports. This places Guinea's industrial sector in a fragile position, as its economic prospects today entirely depend on the aluminum ore demand in China as well as the gold demand in UAE. These findings suggest a very high vulnerability of Guinea's economy and illustrate the urgency of pursuing an effective industrial diversification strategy in the country.

Within this diversification strategy, the upgrading of the structure of the manufacturing sector towards producing and exporting products with higher technological content is one key element that deserves attention. In 2018 Guinea's share of medium and high tech (MHT) manufactured exports was only 1%, significantly lower than all benchmark countries. In particular the processing of aluminum ore into alumina (refinery) and aluminum (smelter) offers a significant potential for multiplying the value addition in the country in the medium to long term. However, this process will require a dedicated initiative of building modern industrial capabilities, in particular a large-scale energy system and the required infrastructure and human skills development.

A lot of unused potential also exists in agro-based value addition, as most of the country's arable land is still unexploited. Guinea is highly dependent on imports of unprocessed agricultural commodities as well as agro-processing goods, mainly from the European Union. Substituting these imports with domestically manufactured food products seems to offer a potential for developing this sector. Effectively supporting agro-based value chains and enhancing the access to logistics and infrastructure are crucial building blocks of this strategy. These findings demonstrate the urgency of a strategic Industrial Policy, which should serve as the main tool to promote the shift from raw material dependency to a more diversified, resilient and modern manufacturing sector.

The lack of a structural transformation of Guinea's economy also has significant social implications. To date, the majority of the population is still sustained by the agriculture sector, with over 60% of total employment, while the manufacturing sector absorbs only 2,5% of workers. Furthermore, employment in the informal sector, which usually offers less benefits and security for workers, is highly prevalent. An Inclusive and Sustainable Industrial Development requires the active promotion of economic opportunities for all. In Guinea, the share of female workers in the manufacturing sector is only 26%, significantly below other ECOWAS countries. One of the quickest ways to reduce poverty is women economic empowerment, and hence deserves particular attention within Guinea's industrial policy development. Equally important is the participation of the youth. In Guinea, 60% of the population is under the age of 24, which offers a huge potential for the country to generate a demographic dividend. To date, 23% of Guinea's youth are not employed nor involved in any education or training activities. There is also a gender discrepancy, as 28% of the female youth do not have access to these activities compared to 18% of their male peers.

Access to energy is at the core of any country's industrial development. In Guinea, access to electricity is one of the main bottlenecks for the development of the manufacturing sector. In 2018, 44% of the population had access to electricity, a performance slightly below the

ECOWAS average of 48%. The lack of equal access to electricity can create regional development imbalances, as in 2016 less than 7% of the rural population could use electricity compared to 80% of the urban population. The active promotion of general access to electricity can facilitate the creation and upgrading of manufacturing enterprises all over the country. However, to date Guinea's electricity production capacity is lower than its peer countries, only producing around 98 GWh per one million people. On the other hand, Guinea's potential for renewable energy production, particularly hydropower, is around 26,000 GWh/year and hence offers the opportunity to provide power for the energy intensive processing of aluminum ore into finished aluminum in the country.

Nevertheless, considering the environmental performance of industry, hydropower projects need to be treated carefully as they can cause negative environmental impacts in the long term. For instance, dams can reduce the quantity and quality of water and cause loss of biodiversity. In addition, considering the future development of the aluminum sector, efforts must be made to avoid the potential harmful effects this industry has on both the environment and local communities. Without an environmentally sustainable industrial strategy, future generations might be deprived from benefits. As a case in point, Guinea's material efficiency was 219 USD per ton of material in 2017, the lowest among benchmark countries. Increasing the material efficiency at both the national and industry level is a crucial component to move the economy from resource-intensive activities towards higher-value added production methods.

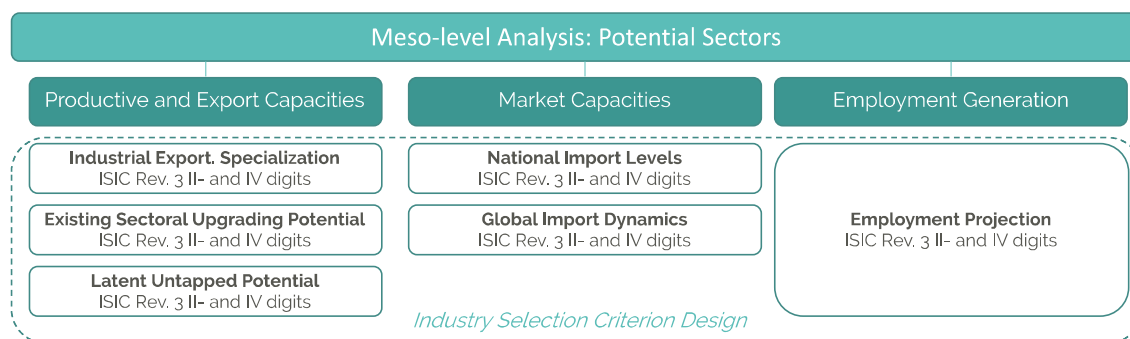
The development of a New Industrial Policy for Guinea comes timely and its urgency is undeniable. Through a goal oriented and participatory approach, the strategy should be developed in close coordination with the most relevant policies related to energy, mining and agriculture. The private sector, and in particular also the informal sector, must be directly involved in the Industrial Policy design process in order to identify and tackle the main challenges that prevent the manufacturing sector's growth and formalization.

2. Analysis of manufacturing sectors

2.1. Structure of analysis

This section presents a sector-level analysis of the manufacturing industries in Guinea, based on six pillars to cover three separate dimensions, namely i) production and export capacities, ii) market capacities, and iii) employment generation. Based on these, a set of attractive manufacturing sub-sectors is identified. The manufacturing sector classification follows the International Standard Industrial Classification, Revision 3 (ISIC Rev. 3) database by the United Nations Statistics Division (UNSD, 2020) and is described in greater detail in Section 2.2.2 as well as Appendix B.1.2. Attractive sectors are identified at the ISIC Rev. 3 II-digit level as well as the more granular sub-sector level corresponding to the ISIC Rev. 3 IV-digit classification. Lastly, it is verified whether the national development strategies incorporate sectors identified by the analysis. Figure 2.1 illustrates the structure of this section

Figure 2.1. Structure of the Analysis



Source: UNIDO - GPI

2.2. Industry selection criterion design

2.2.1. Pillars

The industry selection criteria design which lies at the heart of this meso-level analysis builds upon the following components:

- **Existing production and export capabilities⁸:** it assesses the competitiveness of certain manufacturing industries of Guinea in relation to global markets. The indicators and analysis proposed in this segment identify sectors that demonstrate existing as well as potential capabilities in global trade patterns:
 - The first criterion used to analyze this dimension is Industrial Export Specialization (IES). A high IES in a sector corresponds to highly developed and existing production and export capabilities of the respective sector which manifests itself in the sector's global competitiveness. The concept, that draws from the Revealed Comparative Advantage approach, is introduced in Section 2.3.1 as part of the in-depth sub-sector analysis which

⁸ Another possible indicator for the analysis is the Emerging Industrial Export Specialization. However, this index did not point to any potential sectors in Guinea. The concept and the analysis are disclosed in appendix B.2.1.

aims at identifying a selection of attractive ISIC Rev. 3 II-digit as well as IV-digit sub-sectors.

- The second criterion used is the sectoral upgrading potential of existing sectors based on the potential for moving into more sophisticated and higher value-added activities within these sectors. It identifies value chains that can be further developed from activities that already take place in the country. The criterion is introduced in Section 2.3.2 as part of the in-depth sub-sector analysis which aims at identifying a selection of attractive ISIC Rev. 3 II-digit as well as IV-digit sub-sectors.

- The third criterion used to analyze the production and export capacities of Guinea is the Latent Untapped Potential (LUP). It identifies hidden or obscured production capacities that currently remain below the national potential in relation to trends that are otherwise observed across comparable countries. The concept of the Latent Untapped Potential is introduced in Section 2.3.3 as part of the in-depth sub-sector analysis which aims at identifying a selection of attractive ISIC Rev. 3 II-digit as well as IV-digit sub-sectors.

- **Market capacities:** They identify a large domestic demand base as well as the existence of dynamic international markets.

- The first criterion used to analyze this dimension is the Import Substitution Potential captured by the national import levels for one specific sector. More specifically it evaluates the size of sector-level imports (per capita) of manufacturing sectors and highlights the potential for import substitution as a result of high national demand which is currently accommodated through high imports. The concept of National Import Levels is introduced in Section 2.3.4 as part of the in-depth sub-sector analysis which also identifies a selection of attractive ISIC Rev. 3 II-digit as well as IV-digit sub-sectors.

- The second criterion used to analyze this dimension is the Global Import Dynamics. It highlights sectors where global demand is fast-growing and identifies sectors with the potential to gain importance as a consequence of increasing global demand. Sectors identified in this way may allow the country to tap into an expanding and dynamic global market with extensive opportunity to future growth moving forward. The concept of Global Import Dynamics is introduced in Section 2.3.5 as part of the in-depth sub-sector analysis which aims at identifying a selection of attractive ISIC Rev. 3 II-digit as well as IV-digit sub-sectors.

- **Employment generation:** It projects the employment level of manufacturing industries for countries of a similar economic configuration as Guinea.

- The criterion used to analyze this dimension is criterion Employment Projection which evaluates the potential of a sector to generate employment. Because of the lack of data, it is not possible to compare the projected employment patterns with actual country-level observations. Rather, the indicated employment levels serve as a rough guideline in terms of which manufacturing sectors are expected to produce the highest contribution of manufacturing employment at a given income level. The concept of Employment Projection is introduced in Section 2.3.6 as part of the in-depth sub-sector analysis which aims at identifying a selection of attractive Rev. 3 II-digit as well as IV-digit sub-sectors.

2.2.2. Industry classification and data sources

The manufacturing sector level classification used in this analysis follows the International Standard Industrial Classification, Revision 3 (ISIC Rev. 3) database by the United Nations Statistics Division (UNSD, 2020) and is described in Section B.1.2. Whenever possible and unless noted differently, the concepts described above are analyzed on the II-digit level, and are further brought down to a more disaggregated level, i.e. ISIC Rev. 3 IV-digits, in order to identify sub-sectors that can be associated with interesting product groups.

All trade-related data is taken from UN-COMTRADE (2020) and follows the Standard International Trade Classification (SITC) Revision 2. Correspondence between both the SITC commodity classifications and the ISIC Rev. 3 manufacturing sector classification is established as described in Section B.1.1. Throughout the report, only trade in manufacturing-related commodities is considered. Consequently, whenever talking about trade-related indicators, the analysis is based on traded commodities that can be attributed to a certain manufacturing sector and follow the re-classification procedure discussed in Section B.1.1. An additional caveat is that - as a result of a lack of more detailed data - all trade analysis is performed on the level of gross exports and gross imports which, by definition, also include re-imports as well as re-exports. Due to the unavailability of country-level trade data for the entire period covered by this chapter (2010 to 2018), "mirrored" trade data reported by Guinea's trading partner countries is used⁹.

Employment data on the ISIC Rev. 3 II- and IV-digit level comes from (INDSTAT, 2020) while any macroeconomic variables are taken from Feenstra et al. (2015a). Income group classifications, as well as manufacturing sector technology classifications, are taken from World Bank (2019c) and OECD (2011) respectively.

2.2.3. Summary of results

Manufacturing in Guinea is still a nascent economic activity, with a high concentration of output in products based on natural resources that share many characteristics of primary commodities. However, it is possible to observe the existence of some relevant industrial production and export capacities especially in the sectors of basic metals, and food, beverages and tobacco, with a focus on the sub-sectors of basic precious and non-ferrous metals, as well as processing and preserving of fish. There is a great potential for industrial development from the deepening of these sectors, in particular the main short to medium-term opportunity for the country lies in the further development of the aluminum value chain and the agro-processing industry, based on existing capacities.

A wide range of opportunities for medium- as well as long-term import substitution can also be identified, in particular in grain mill products (rice), basic iron and steel, machinery for mining, and other food products. The sectoral analysis also shows that Guinea is poorly integrated with global market dynamics, benefiting very little from the growth of world imports in several segments. In this respect, the following sectors represent potentialities for Guinea due to rapidly growing global demand: transport equipment, coke, refined

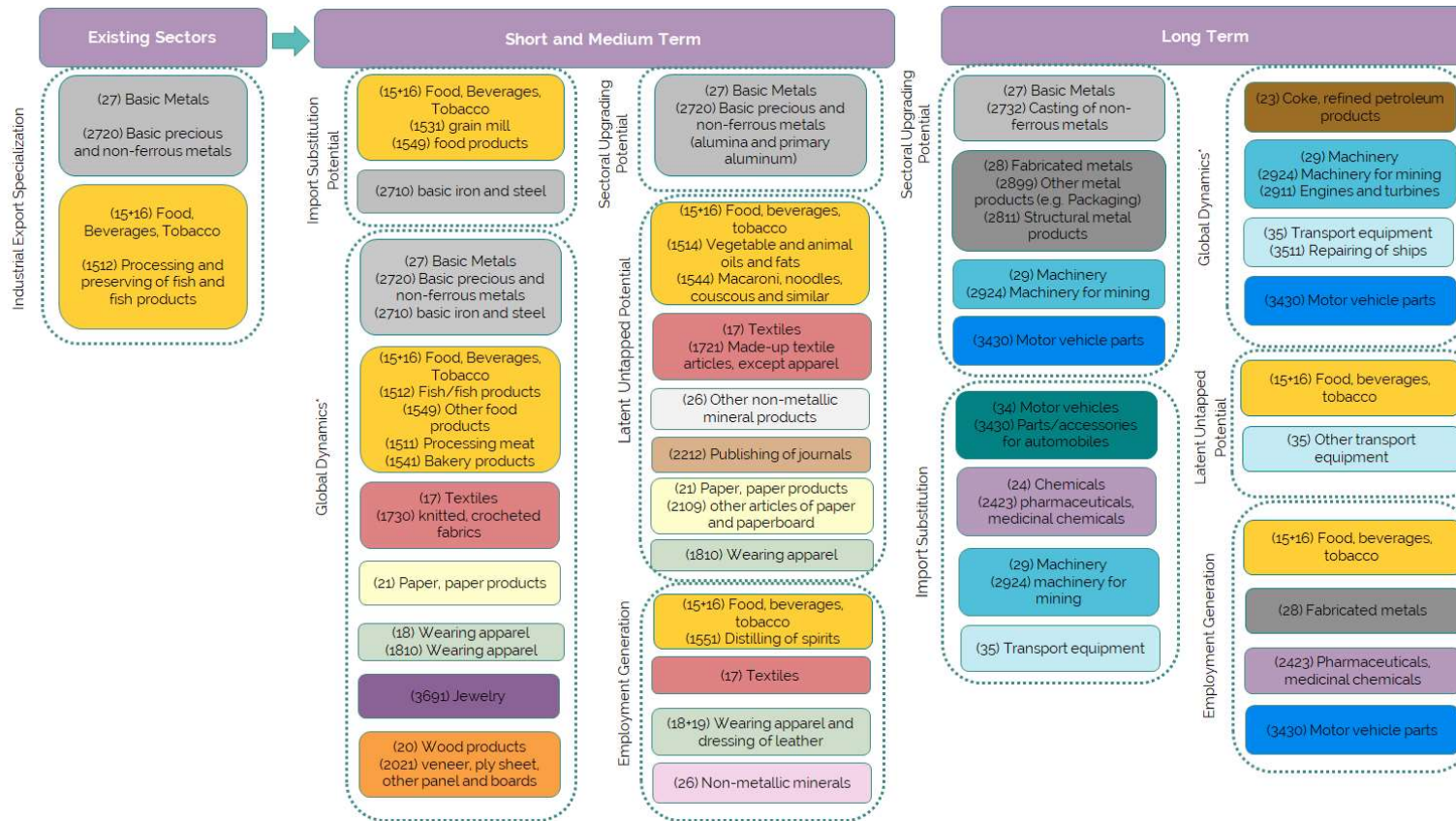
⁹ Guinea country-level data is only available for the years between 2013 and 2016 in the UN Comtrade Database. Country data availability can be found at <https://comtrade.un.org/data/da>

petroleum products, wood products, wearing apparel, basic metals, food, beverages, and tobacco, and paper and paper products.

In addition, the employment projection analysis shows that the sector of food, beverages and tobacco is most likely the sector that will contribute most to employment generation not only for countries at Guinea's income per capita level, but also for middle and high-income countries. Based on other countries experiences, for the short and medium-term strategy, textiles and wearing apparel could also contribute significantly to job creation, however, employment levels are unlikely to be sustained at later stages of development. As income per capita rises, fabricated metals may intensify their positive effects in terms of employment, making it an attractive sector to consider for sustainable industrial job creation.

Figure 2.2 provide a summary of the findings of the meso-level analyses, distinguishing between existing sectors, short-to-medium term potentials and long-term potentials.

Figure 2.2. Summary of identified existing and potential sectors in the short/medium and long term¹⁰



Source: UNIDO - GPI.

Note: Selected sectors. For the complete list, please see all sections in Chapter 2.

¹⁰ The distinction between short-term and long-term targets is based on the acknowledgement, that certain advanced manufacturing activities require a higher level of industrial capabilities than more basic activities. The long-term target sectors presented here will presumably require a longer time horizon to strengthen the industrial capabilities that are a prerequisite for entering these production activities than the short-term targets, which could become feasible more quickly."

2.3. Manufacturing sector analysis

This section discusses the results of the manufacturing sector analysis for each of the six criteria defined in Section 2.2. The analysis is first conducted on the level of ISIC Rev. 3 II-digit sectors in order to identify broader potential sectors, and furthermore delves into the identification of the corresponding more disaggregated ISIC Rev. 3 IV-digit sub-sectors. Additional and complementary information on specific characteristics as well as methodological and practical explanations are provided in text boxes throughout this section.

2.3.1. Industrial export specialization (IES)

Definition of concept

This criterion identifies the industrial export sectors in which the country is more specialized in comparison to the world average for that specific sector. Indicators higher than 1 correspond to high specialization and indicate higher industrial export production and export capabilities in the respective sector: The value gives an approximation of the level of specialization, with an IES > 1 a country exports more of a particular good than would be expected given its overall propensity to export. The concept draws from the Revealed Comparative Advantage methodology; however, the indicator is adjusted to isolate the industrial sector from the rest of the economy, hence capturing better small movements within the manufacturing sector. A technical description of the concept of the Industrial Export Specialization Indicator can be found in Section B.1.3.

Results II-digit sector analysis

Considering the latest available data (2018), Guinea shows industrial export specialization only in two sectors from all ISIC Rev. 3 II-digit manufacturing industries. The most prominent is sector (27) basic metals, with an index of 12.9 (table 2.1). The second one is (15+16) food, beverages, and tobacco, however, it stands only slightly above the indicator's minimum threshold for specialization (1.4) and shows a substantive gap from the first-placed. Also, it is worth noting that while the specialization on basic metals has increased over time, food, beverages, and tobacco went in the opposite direction, revealing that the sector has been somewhat losing its export specialization in recent years (figure 2.3). Nonetheless from the UNIDO Guinea Firm level Survey 2021 the food beverages and tobacco sector has the highest frequency of respondents identifying it as the sector with a high value added potential in the next 5/10 years (19 answers).

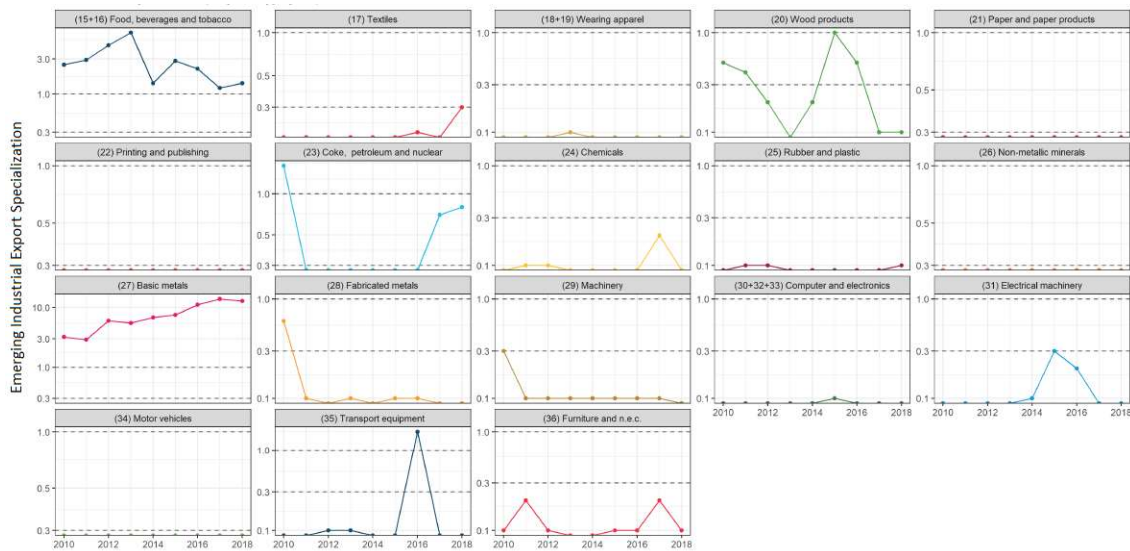
Table 2.1. Guinea: Industrial Specialization by sector, 2018 (ISIC rev.3 II-digits)

Ranking	ISIC Rev. 3 2-digit sector	Industrial Export Specialization Index	Classification
1	(27) Basic metals	12.9	Highly Specialized
2	(15+16) Food, beverages and tobacco	1.4	Specialized
3	(23) Coke, petroleum and nuclear	0.8	Non-specialized
4	(17) Textiles	0.3	Non-specialized
5	(25) Rubber and plastic	0.1	Non-specialized
6	(36) Furniture and n.e.c.	0.1	Non-specialized
7	(18+19) Wearing apparel	0.1	Non-specialized
8	(21) Paper and paper products	0.0	Non-specialized
9	(22) Printing and publishing	0.0	Non-specialized
10	(24) Chemicals	0.0	Non-specialized
11	(26) Non-metallic minerals	0.0	Non-specialized
12	(28) Fabricated metals	0.0	Non-specialized
13	(29) Machinery	0.0	Non-specialized
14	(30+32+33) Computer and electronics	0.0	Non-specialized
15	(31) Electrical machinery	0.0	Non-specialized
16	(34) Motor vehicles	0.0	Non-specialized
17	(35) Transport equipment	0.0	Non-specialized

Source: United Nations Comtrade Database (UNSD).

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

Figure 2.3. Guinea: Industrial Export Specialization by sector, over time (ISIC Rev. 3 2-digits, weighted 4-digit aggregates)



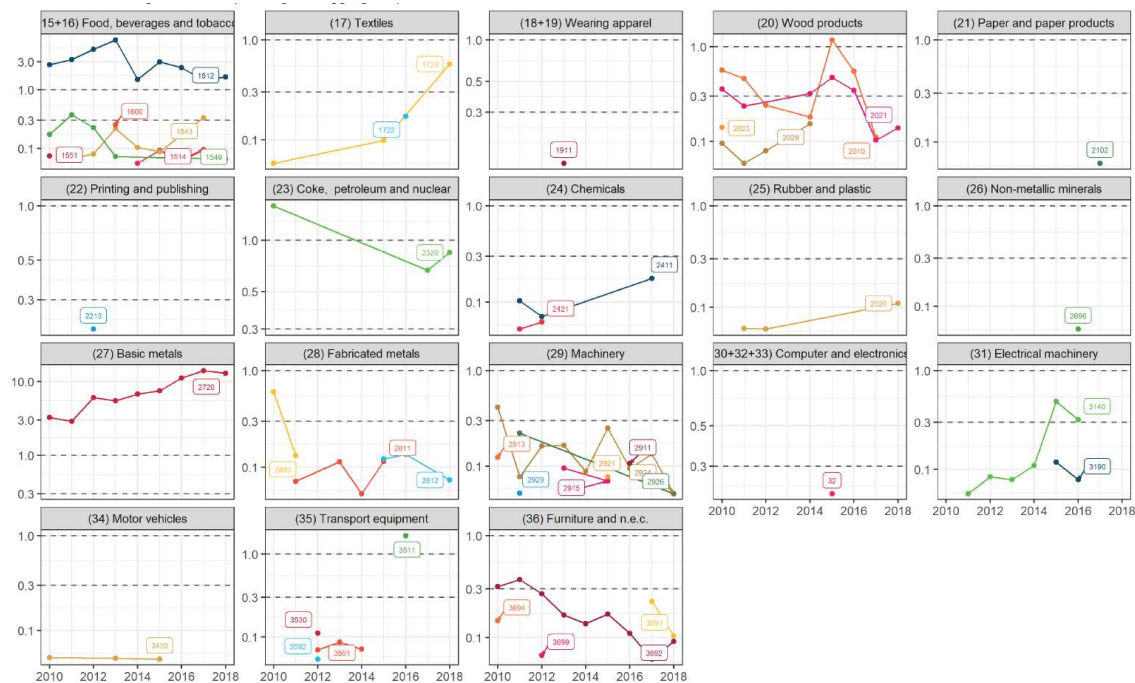
Source: United Nations Comtrade Database (UNSD).

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

Results IV-digit sector analysis

At a more disaggregated level (IV-digit), sub-sectors *(2720) Manufacture of basic precious and non-ferrous metals* and *(1512) Processing and preserving of fish and fish products* are the only ones that show high industrial export specialization, thus higher production and export capabilities (figure 2.4). In the case of sector 2720, the main products exported by Guinea are unwrought non-monetary gold and alumina. The same patterns seen in the II-digit level analysis are observed here: *(2720) Manufacture of basic precious and non-ferrous metals* have a much higher IES than *(1512) Processing and preserving of fish and fish products*. Moreover, the former shows an upward trend over the years while the latter follows a downward path.

Figure 2.4. Guinea: Industrial Export Specialization by sector, over time (ISIC Rev. 3 4-digits)



Source: United Nations Comtrade Database (UNSD)

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

BOX 2.1: SUB-SECTORAL CONCENTRATION OF EXPORT CAPABILITIES: Composition of sectors (27) Basic Metals and (15) Food and Beverages

A more detailed sub-sectoral analysis demonstrates that the production and export capabilities of Guinea's manufacturing sector are even more concentrated in very few products. *Basic Metals (27)* exports are exclusively concentrated in aluminum and gold in 2018, while for sector (15) *Food and Beverages*, the concentration is lower but still very significant: frozen fish (not elsewhere specified) accounted for 76% of the sector's total exports (figure 2.5).

These findings along with the previous ones show that overall Guinea has an extremely low capability of producing and exporting manufactured products competitively, and even the few sectors that display greater capabilities at first, have their production and exports concentrated in only one or two products. Because of this pattern, there is no dissemination of knowledge and capacities within and among sectors which is essential for the process of industrial development to occur. Overcoming this situation requires a major effort by the country to build its industrial base, not only by deepening capacities it already has but also by creating new ones that can connect with existing sectors or even build new manufacturing niches.

Figure 2.5. Share of sub-sectors on total exports of sector (15) Food and Beverages

Export structure Guinea mirrored

Sector (15+16) food, beverages and tobacco 2018.



Traded USD in sector (15+16) food, beverages and tobacco by ISIC Rev. 3 IV-digit industry.

For a particular ISIC Rev. 3 IV-digit industry, shares correspond to commodities' contributions to total exports (imports) in relation to each II-digit industry.

Data source: United Nations UN-COMTRADE (2020) database.

Note: ISIC Rev. 3 2-digit industries as described in Appendix B.1.2. Concordance between trade and industry classifications according to Appendix B.1.1.

2.3.2. Existing sectoral upgrading potential

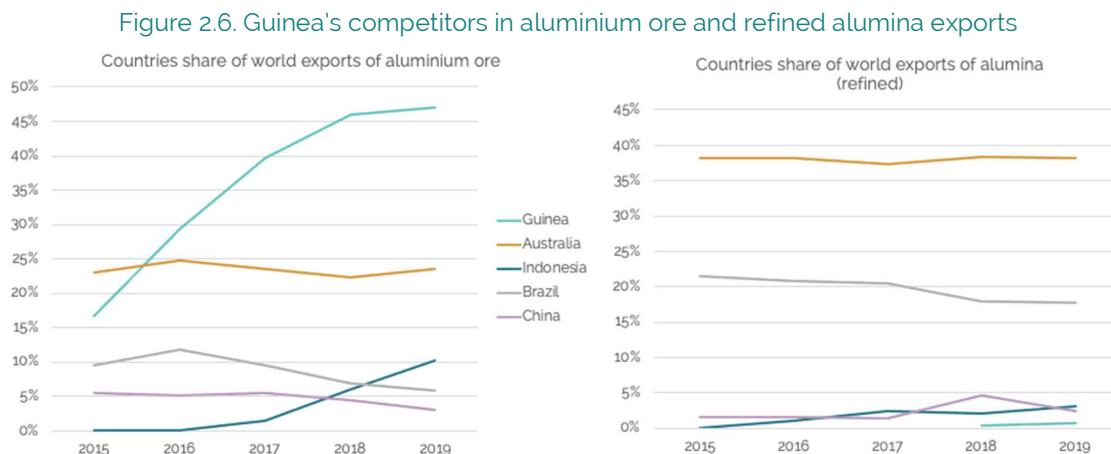
Definition of concept

The sectoral upgrading potential criterion identifies existing sectors that have the potential of incorporating new, more sophisticated, and higher value-added activities by further developing the value-chain of existing activities that exhibit production and export capabilities.

Results: Industrial upgrading potential within the basic metal sector

As far as basic metals are concerned, on the one hand, our analysis of Guinea's export structure in block 1 as well as block 2 exposes the country's current lack of capacity to operate in more diversified and sophisticated segments of the basic metal sector. On the other hand, it also points to development opportunities for the medium and long-term. The country could take advantage of its large bauxite production to advance to downstream segments of the aluminum value chain, which generate greater value-added, require more qualified workers, and have stronger linkages with the rest of the economy than the mining activities.

Figure 2.6 illustrates that Guinea has recently become the largest global exporter of aluminum ore, but fails to follow its key competitors with significantly smaller bauxite reserves and exports, in particular Australia and Brazil, into the stage of refined alumina exports.

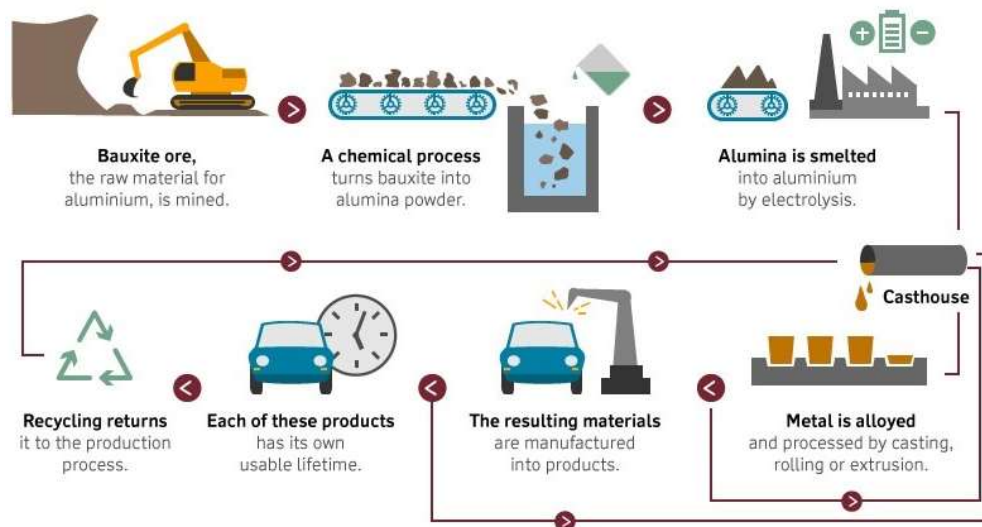


Source: United Nations Comtrade Database (UNSD).

For now, Guinea has a strong presence only in the first stage of the aluminum value chain (figure 2.7) and an incipient one in the refining stage. As a long-term development strategy, the country could aim at a fully integrated aluminum industry. As a first step, Guinea could raise its alumina refinery capacity, which seems within reach as one refinery is already operating in the country. In this stage, the experience of Australia and Brazil can inform the development trajectory, as both countries generate significantly larger export revenues from refined alumina than from primary aluminum ore. In the second stage, the target

could be to move to aluminum production, which requires the installation of smelters. Both of these activities are considered part of sub-sector 2720 and hence represent a deepening of existing activities for Guinea. Gradually, the goal could be to upgrade further towards finished aluminum products, e.g. casting aluminum products (sub-sector 2732) and other sectors directly linked to the value chain, such as packaging, metal structures, machinery for mining, and manufacturing automotive parts. Similarly, the long-awaited exploration of the iron ore deposits in Simandou could also be a window of opportunity for the country to develop the steel value chain and encourage the emergence of advanced associated sectors beyond iron ore mining.

Figure 2.7. Stages in the aluminum value chain



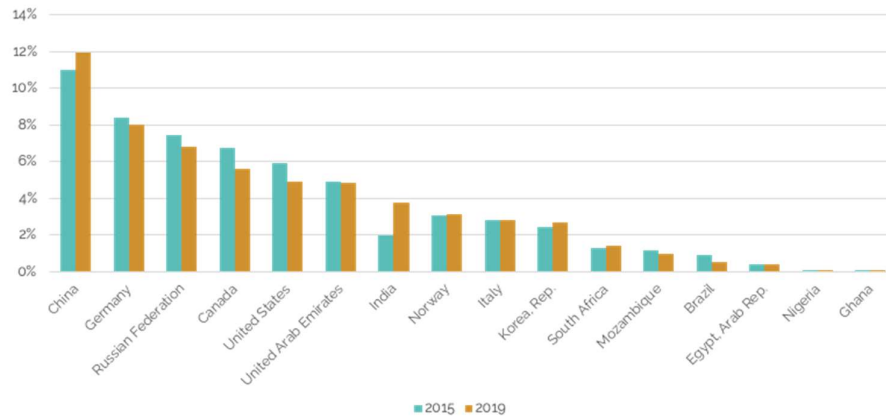
Source: Aluminum Circle - www.alcircle.com

However, significant industrial deepening like this is not likely to happen by itself because it may not be in the immediate interest of global aluminum companies and producer countries. Most importantly, China, the main buyer of Guinea's aluminum ore, also heavily operates in the refining and manufacturing stages in its territory (figure B.3, appendix B.2.2) using a range of direct government support^{lxiii}, such as subsidies to producers of aluminum, and common-alloy aluminum sheet and foil. With this strategy, China has become the leading global exporter of processed aluminum products and now wants to maintain that position (figure 2.8).

Several developed countries without relevant bauxite reserves (e.g. EU countries, Russia, Canada) have also established themselves in the high value added segment of the industry and want to continue importing raw material from Guinea. Accordingly, it doesn't fit with the national development strategies of other countries to build refineries and smelters in Guinea. In addition, Guinea lacks the required industrial capabilities, in particular the energy infrastructure and technical knowledge in those activities, which makes it unlikely that foreign investors will choose the country as a processing hub.

Maybe most importantly, the current export taxation and duty scheme do not encourage local processing of aluminum ore as it provides the same low export tax rate of 2% for primary bauxite exports that it would charge for finished aluminum products.

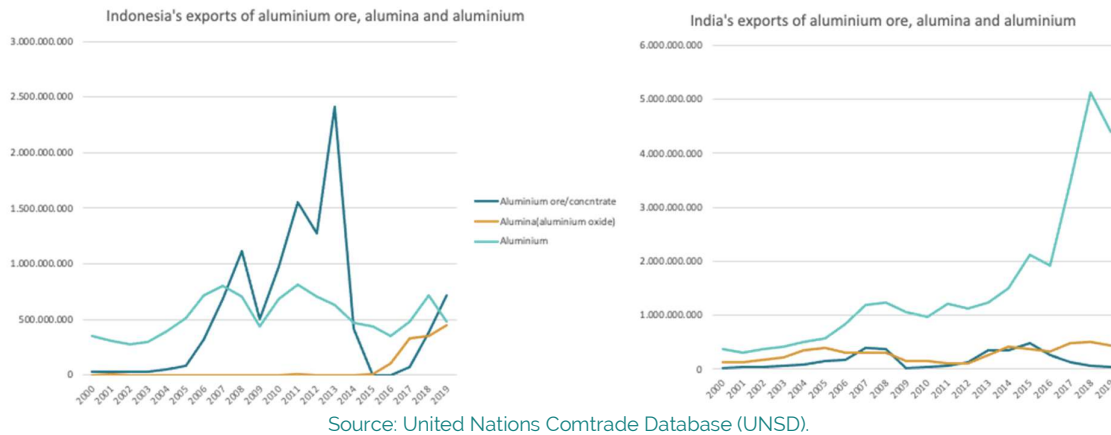
Figure 2.8. Global market shares in the export of processed aluminum



Source: United Nations Comtrade Database (UNSD).

Hence, to foster the development of the basic metal industry, it is necessary that the Government put forward a comprehensive and coordinated range of industrial policy interventions that can facilitate and stimulate the flourishing of more advanced industrial activities in this sector. Within this policy package, it is crucial to address the country's bottlenecks by building productive capabilities, transport infrastructure, and in particular upgrading the energy system. The role of foreign direct investment will probably remain crucial for the sector; however, it needs to be ensured that investors comply with the country's development strategy and that their activities benefit Guinea's society. The fact that Guinea possesses the largest global bauxite reserves puts the country in a good bargaining position to negotiate such a shift. In this respect, the development of a strategic local content policy that mandates domestic processing of bauxite ore could be considered. To inform this policy, the case of Indonesia could be investigated in more depth, as the country conditioned aluminum ore exploration investors to set-up alumina refinery plants and banned bauxite exports for several years. The recent export trend of Indonesia's aluminum sector shows that this strategy has led to a significant expansion of alumina refinery capacities (figure 2.9). India has been pursuing a similar strategy for a longer period of time by imposing a large export tax on low value-added raw materials and has succeeded in creating sizable export capacities in processed aluminum.

Figure 2.9. Case studies in aluminum processing – Indonesia & India



Source: United Nations Comtrade Database (UNSD).

2.3.3. Latent Untapped Potential (LUP)

Definition of concept

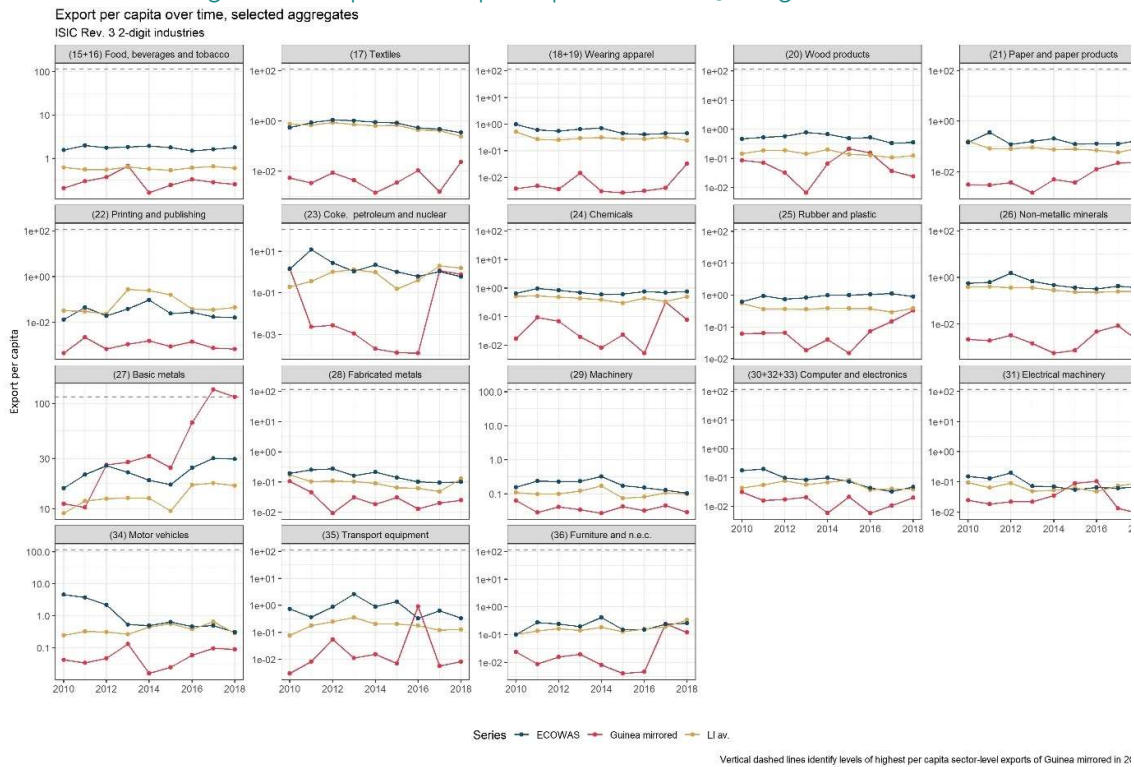
The Latent Untapped Potential (LUP) identifies hidden or obscured production and export capacities that currently remain below the national potential in relation to trends that are otherwise observed across comparable countries. It compares national dynamics in gross exports per capita with average trends observed for low-income countries (LI) and ECOWAS. A sector is identified to have a latent untapped potential if it (a) performs below what is expected for an LI and ECOWAS (b) displays a positive, national growth pattern over time.

Results II-digit sector analysis

Among the sectors that meet the criteria (figure 2.10), (21) *paper and paper products* was the one that showed the highest growth in the period, although it is already close to reaching the level of exports per capita from benchmarking countries. Sectors (26) *manufacture of other non-metallic mineral products*, and (35) *Transport equipment* can also be considered potential under the concept in question. Although the growth rates were not as high as in sector (21), the exports per capita gaps between Guinea and its peers are larger.

The last LUP sector identified is (15+16) *food, beverages, and tobacco*. It is important to highlight that this sector already displays some relevant industrial export capabilities, as shown in item 2.3.1. However, given the wide gap between the level of Guinea exports per capita in relation to ECOWAS, it is evident that there is much more room to grow.

Figure 2.10. Export levels per capita, ISIC Rev. 3 2-digits, over time



Source: United Nations Comtrade Database (UNSD).

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

Results IV-digit sub-sector analysis

Sub-sectors with latent untapped potentials on a more disaggregated level are: (1514) vegetable and animal oils and fats; (1544) macaroni, noodles, couscous and similar farinaceous products; (1721) made-up textile articles, except apparel; (1810) wearing apparel, except fur apparel; (2109) manufacture of other articles of paper and paperboard; and (2212) publishing of newspapers, journals and periodicals. For the list of all figures of the LUP analysis on ISIC Rev. 3 IV-digit level please see Appendix section B.3.

2.3.4. Import substitution potential

Definition of concept

The criterion selects the sectors with the highest level of imports in the latest available year. This indicator captures the size of imports substitution potential for one specific sector. More specifically it measures the size of sector-level imports (USD, per capita¹¹) of manufacturing sectors in Guinea. The indicator measures the potential for import substitution as a result of high national demand which is currently accommodated through high imports¹².

Results II-digit sector analysis

Table 2.2 shows the import levels in USD per capita of all manufacturing sectors for Guinea for the last four years. On the basis this criterion, the following sectors stand out: *(15+16) food, beverages and tobacco, (29) machinery, (24) chemicals, (34) motor vehicles, and (35) transport equipment.*

Complementing the analysis, figure 2.11 reveals that all of the sectors pointed out by the import substitution criterion not only show the highest import per capita levels but their values are also significantly higher than the average of all low-income countries. Moreover, according to figure 2.12 all but *(35) transport equipment* displays a higher growth trend of imports than the benchmarking group, which means Guinea's import dependency for these sectors is expected to exceed the level of other low-income countries even more significantly in the near future.

Table 2.2. Guinea sector import levels per capita over time, ISIC Rev. 3 2-digits

ISIC Sector	Year			
	2015	2016	2017	2018
(15+16) Food, beverages and tobacco	47.64	53.18	58.92	69.19
(17) Textiles	14.77	14.35	12.26	12.21
(18+19) Wearing apparel	20.85	18.78	17.31	14.52
(20) Wood products	0.51	0.59	0.36	0.26
(21) Paper and paper products	3.35	3.62	3.36	3.53
(22) Printing and publishing	1.72	1.69	1.18	1.89
(23) Coke, petroleum and nuclear	0.52	0.33	0.28	0.44
(24) Chemicals	22.75	27.04	31.28	31.92
(25) Rubber and plastic	10.60	9.87	10.84	9.85
(26) Non-metallic minerals	13.15	10.98	7.99	10.34
(27) Basic metals	9.99	8.43	10.73	17.84
(28) Fabricated metals	12.64	10.46	14.50	17.58
(29) Machinery	22.79	22.98	31.66	34.47
(30+32+33) Computer and electronics	12.23	8.21	9.88	13.36
(31) Electrical machinery	21.27	13.84	15.47	17.27
(34) Motor vehicles	16.87	16.58	27.98	23.07
(35) Transport equipment	13.59	14.10	18.32	19.71
(36) Furniture and n.e.c.	11.24	10.18	10.11	10.01

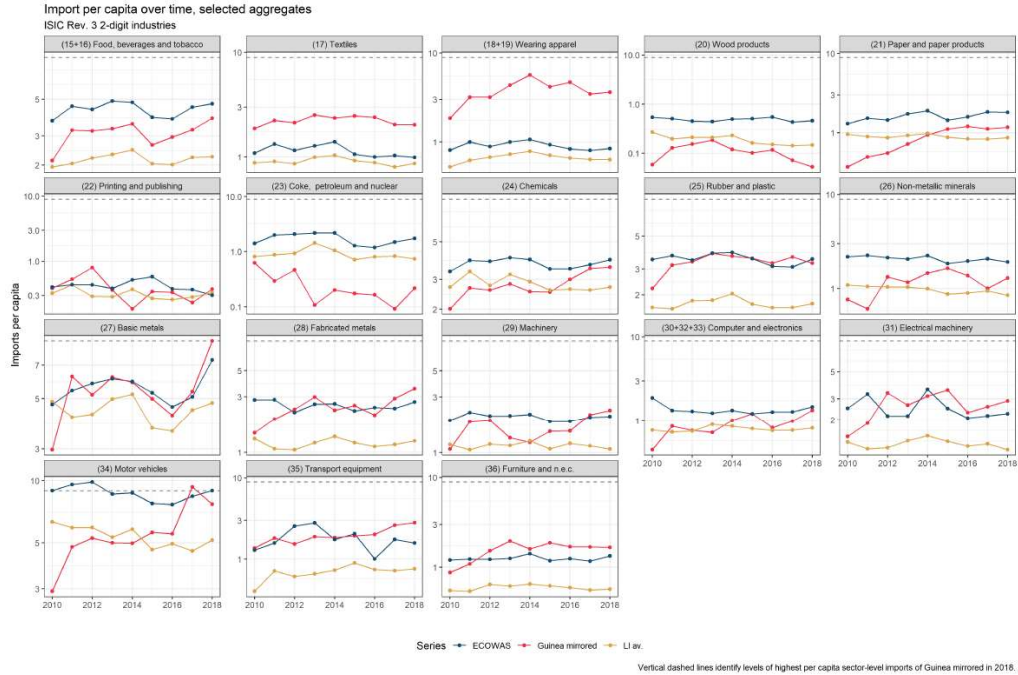
Source: United Nations Comtrade Database (UNSD).

Note: ISIC Rev. 3 II-digit results based on ISIC Rev. 3 IV-digit aggregates. Per capita figures used to account for population-driven demand effects.

¹¹ Per capita figures are used to account for population-driven demand effects.

¹² ISIC Rev. 3 II-digit results based on averages of ISIC Rev. 3 IV-digit aggregates.

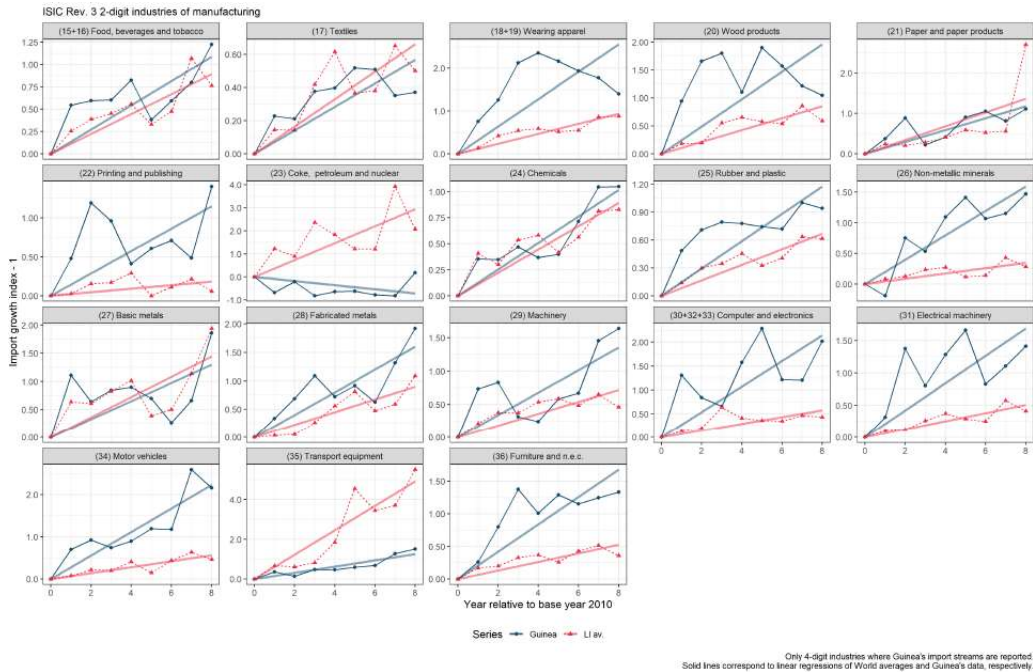
Figure 2.11. Import levels per capita, Guinea and selected group of countries, over time



Source: United Nations Comtrade Database (UNSD)

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

Figure 2.12. Import growth indices and trends, ISIC Rev. 3 2-digits, over time



Source: United Nations Comtrade Database (UNSD)

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

Results IV-digit sub-sector analysis

The ISIC Rev. 3 IV-digit industries with the highest import per capita values are: *(1531) grain mill products*, *(3410) motor vehicles*, *(2710) basic iron and steel*, *(2423) pharmaceuticals, medicinal chemicals and botanical products*, *(2924) machinery for mining, quarrying and construction*, and *(1549) other food products* (which includes manufactures of coffee, tea, foods for infants, spices, frozen prepared food, except fish dinners, among others). The comprehensive list of ISIC Rev. 3 IV-digit industries import per capita is provided in table B.3 appendix B.2.3.

The machinery for the mining sub-sector is particularly interesting because it integrates into the mining value chain that is so prominent in Guinea via backward linkages. The guaranteed demand for mining machinery along with a coordinated set of public policies, requirements, and regulations could drive the value chain towards more diversified and complex activities, thereby reducing foreign production dependency, and improving the level and quality of employment. Given the technological complexity of this sector, the development of adequate industrial engineering capabilities in the country is a key prerequisite to enter this sector.

2.3.5. Global import dynamics

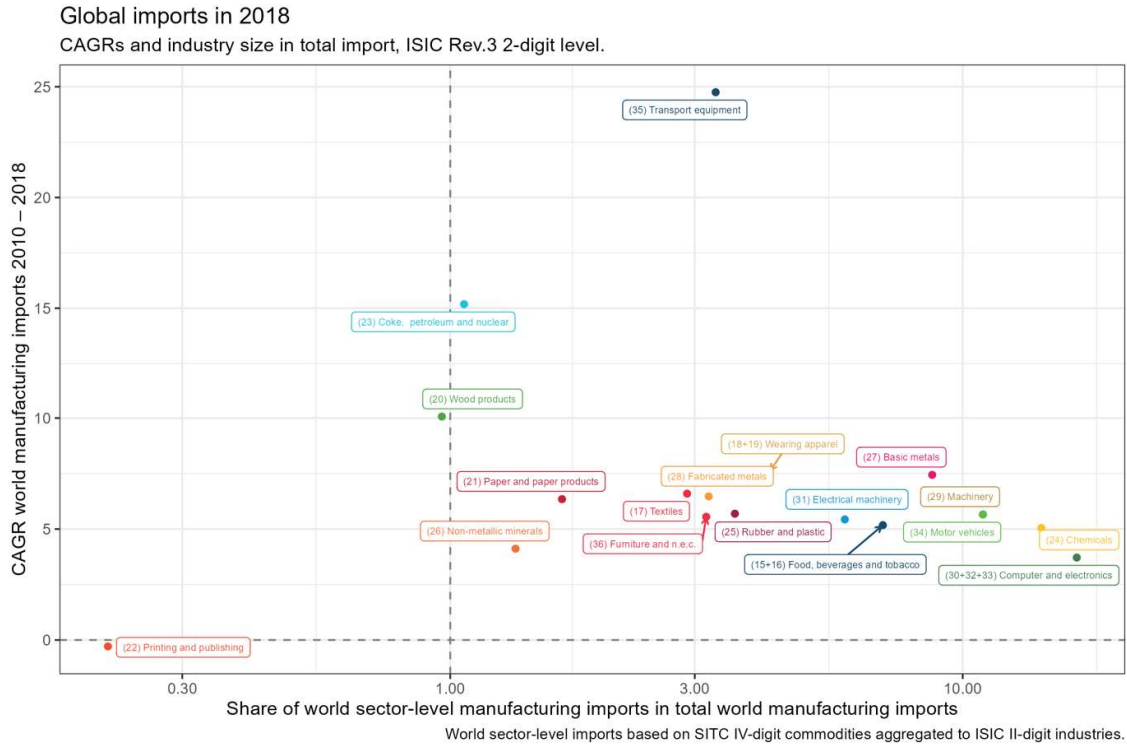
Definition of concept

The criterion selects the sectors with the highest growth rate (vs highest trend) of world imports over the period 2010 - 2018. It highlights the sectors where global demand is growing rapidly and is useful to identify sectors with the potential to gain from global demand. Sectors identified in this way may allow the country to tap into an expanding and dynamic global market with extensive opportunity for future growth moving forward. The selection requirements for this criterion are based on the growth rate (dynamism) of a particular sector as well as its overall size (measured in its share in total manufacturing imports). While this criterion offers a good indication of sectoral global market opportunities, given Guinea's very limited existing industrial production capacities, it is unclear whether the country will be able to successfully tap into these markets.

Results II-digit sector analysis

The sector that shows the highest compound annual growth rate (CAGR) from 2010 to 2018 is (35) transport equipment (figure 2.14). Its share of the global imports is also significant (about 3,5%), hence offering strong demand-driven opportunities. With a lower but still very high growth rate, (23) coke, refined petroleum products and nuclear fuels also stand out, however, it is important to highlight that the sector only accounts for 1% of total global imports. The same is visible in (20) wood products, but with a lower growth rate. Also, the following sectors are very attractive due to their larger slice of the world imports, at the same time they present a quite high CAGR: (18) wearing apparel, (27) basic metals, (15+16) food, beverages, and tobacco, and (21) paper and paper products.

Figure 2.14. Global Import CAGR vs. sector share, ISIC Rev. 3 2-digits, 2010-2018



Note: ISIC Rev. 3 II-digit industries as described in Appendix B.1.2. Concordance between trade and industry classifications according to Appendix B.1.1. CAGR: Compound Annual Growth Rate defined as $CAGR = (EV - BV)^{1/n} - 1$, where EV = ending value, BV = beginning value, n = number of year.

Results IV-digit sub-sector analysis

A large set of sub-sectors exhibited a positive CAGR in the global market between 2010 and 2018. Among those, the following ones demonstrated both high growth rates and more significant weight in total world imports, therefore, the most attractive sub-sectors from the global import dynamics point of view are:

- Food, beverages and tobacco:
 - (1512) processing and preserving of fish and fish products
 - (1552) Manufacture of wines
 - (1549) other food products n.e.c.
 - (1541) bakery products
 - (1511) production, processing and preserving of meat and meat products
- Textiles and wearing apparel:
 - (1730) knitted and crocheted fabrics and articles
 - (1721) made-up textile articles, except apparel
 - (1810) wearing apparel, except fur apparel
- Wood and wood products:
 - (2010) Sawmilling and planing of wood

- (2021) veneer sheets; plywood, laminboard, particleboard and other panels and boards
- Coke, refined petroleum products and nuclear fuel:
 - (2320) refined petroleum products
- Basic metals:
 - (2720) basic precious and non-ferrous metals
 - (2710) basic iron and steel
- Machinery:
 - (2911) engines and turbines, except aircraft, vehicle and cycle engines
 - (2924) machinery for mining, quarrying and construction
- Radio, television and communication equipment and apparatus:
 - (3210) electronic valves and tubes and other electronic components
 - (3130) television and radio receivers, sound or video recording or reproducing apparatus, and associated goods
- Electrical machinery and apparatus n.e.c.:
 - (3410) motor vehicles
- Other transport equipment:
 - (3511) Building and repairing of ships
 - (3520) railway and tramway locomotives and rolling stock
- Furniture and manufacturing n.e.c.:
 - (3691) jewelry and related articles
 - (3694) games and toys

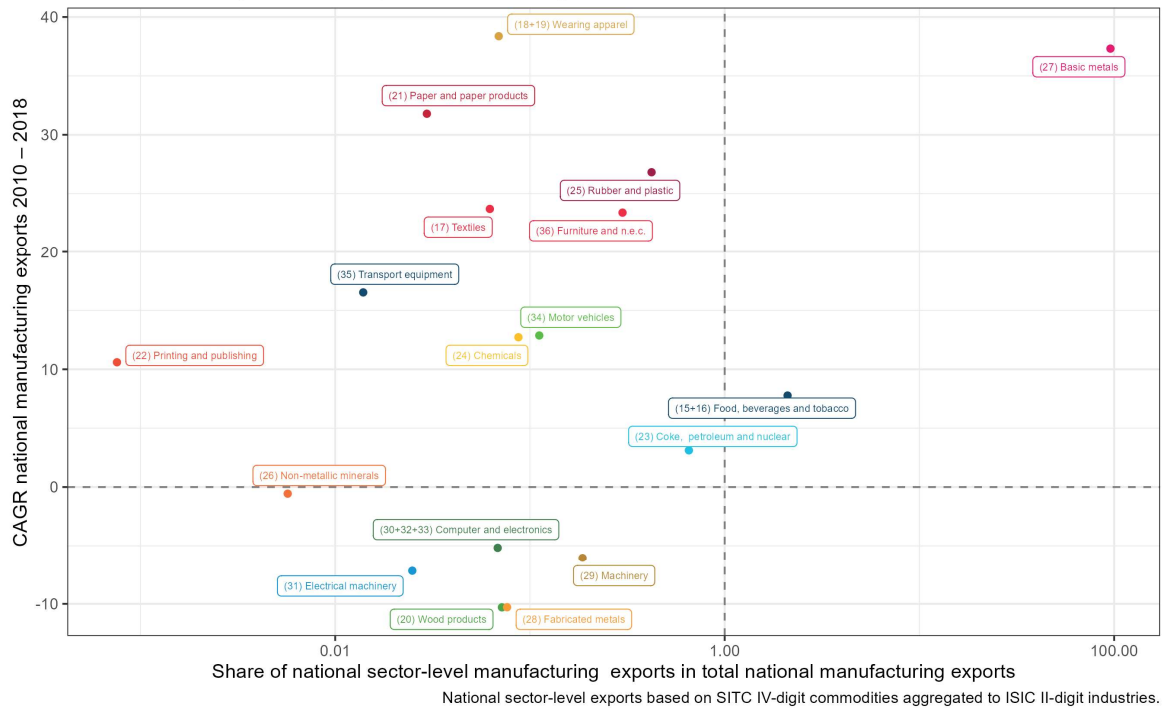
BOX 2.3: Assessment of the sector-level integration process of Guinea

This box evaluates national export dynamics of the manufacturing sectors in relation to the results in Figure 2.15. Guinea already presents some industrial export capabilities and high growth rates in foods, beverages and tobacco, and basic metals, which indicates the country can take advantage of external markets in these sectors (figure 2.16). Furthermore, most of the fast-growing products largely demanded by the globe are related to the aluminum value chain or agro-processing industry, industrial segments already highlighted in this chapter as possible avenues for Guinea's industrial development.

Figure 2.15. Country-level export CAGR vs. sector share, ISIC Rev. 3 2-digits, 2010-2018

Guinea Exports in 2018

CAGRs and industry size in total export, ISIC Rev.3 2-digit level.



Data source: United Nations UN-COMTRADE (2020) database

Note: ISIC Rev. 3 II-digit industries as described in Appendix B.1.2. Concordance between trade and industry classifications according to Appendix B.1.1. CAGR: Compound Annual Growth Rate defined as $CAGR = \frac{EV - BV}{n - 1}$, where EV = ending value, BV = beginning value, n = number of year.

BOX 2.3: Continuation

Regarding to the sub-sectors at IV-digit level, Guinea presented faster growth only in the following:

- (1541) bakery products
- (1730) knitted and crocheted fabrics and articles
- (1810) wearing apparel, except fur apparel
- (2720) basic precious and non-ferrous metals
- (2911) engines and turbines, except aircraft, vehicle and cycle engines
- (3410) motor vehicles
- (3691) jewelry and related articles

Although the country has presented positive growth in several sub-sectors (figure B.6, appendix B.2.4), only a small number coincides with the global sectors that have shown rapid growth between 2010-2018. This shows that the country is not much integrated with the world dynamics, hence not taking advantage of the opportunities global demand has been offering. Block 1 has already highlighted that the same is true for regional markets for manufactured products in ECOWAS and SSA, where Guinea also does not play any meaningful role yet. However, given the proximity and structural characteristics of these regional markets, it could be considered to focus an export-oriented strategy for Guinea here rather than immediately targeting the world market. This opportunity could be analyzed in more detail during the industrial policy design process, with a specific analysis of industrial market demand in ECOWAS countries.

2.3.6. Employment projections

Definition of concept

The criterion selects the sectors with the highest employment levels across all industrial sectors at the GDP (per capita) income level of Guinea. The indicator captures the potential of a sector to generate employment. Because of the lack of data, it is not possible to compare the projected employment patterns with actual country-level observations of Guinea; see Appendix B.1.5

for more information. Consequently, the results should serve as a guideline in terms of which manufacturing sectors could generally be expected to produce the highest contribution of manufacturing employment at a given income level. However, given the lack of data for Guinea, the results should be handled with caution.

Results II-digit sector analysis

As shown in figure 2.17, the sector with the greatest potential for job creation at Guinea's level of income per capita is (15+16) food, beverages and tobacco. The strong effects of this sector on employment are also expected to be observed at all stages of a country's development, including in high-income countries. Therefore, it generally exhibits great potential for short, medium, and long-term development strategies. Considering that Guinea already has some production and export capabilities in this sector, reinforcing them seems to be a promising approach to foster the countries' socio-economic

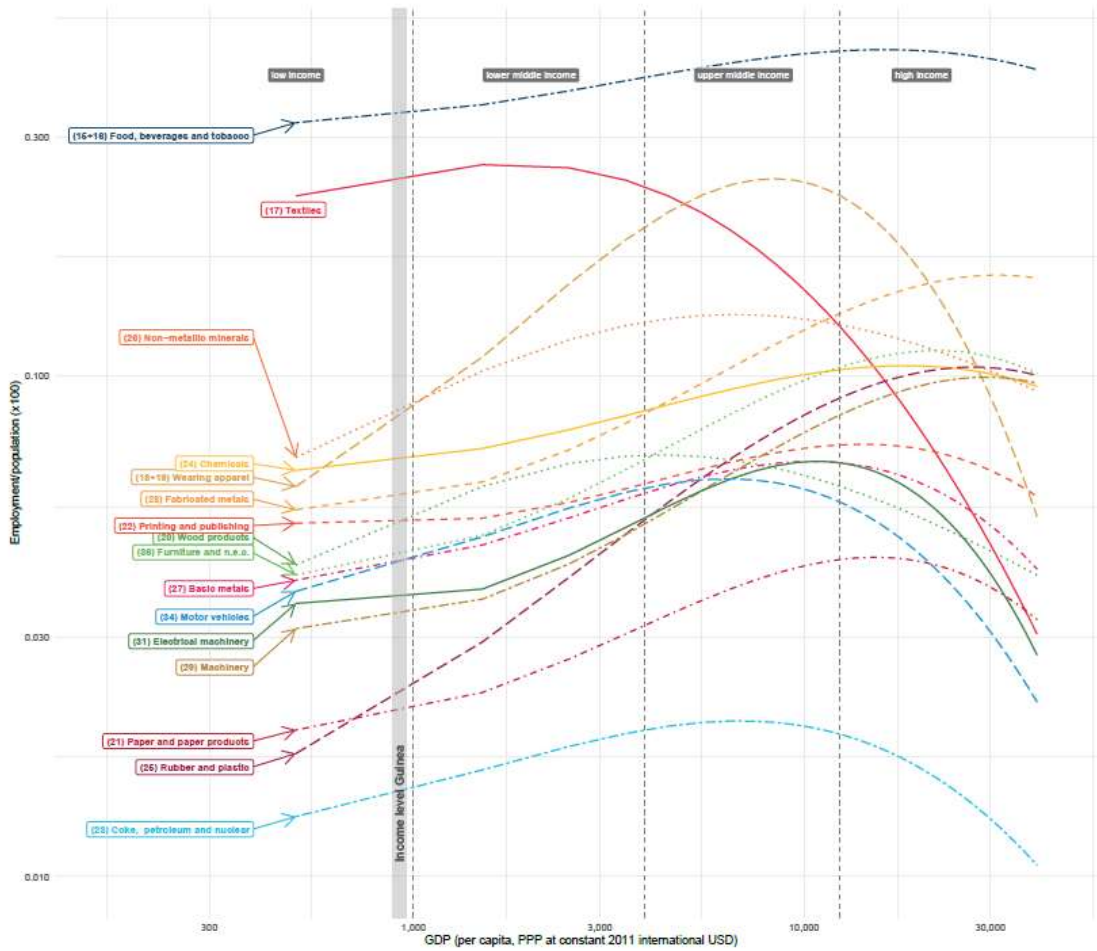
development. The strong backward linkages to the agriculture sector, which currently absorbs most of Guinean labor, is another striking argument.

From a global perspective, the (17) Textiles sector usually fosters employment in lower levels of income per capita, however, as countries enter in a middle-income position the projections reveal a fast sharp downward trajectory. For the short and medium-run, sectors (18 + 19) wearing apparel and (26) non-metallic minerals also stand out as potential drivers of employment for low-income countries, however, they are not expected to hold up among countries with higher income levels. From the UNIDO Guinea firm level survey 2021, respondents assign to wearing apparel the highest frequency when they identify the sector with the highest employment potential. In the case of textiles, the negative effect on job creation is already likely to happen in countries that are on the brink of moving from low-middle to upper-middle-income.

At a lower level than the others, but still standing out, is sector (28) fabricated metals. What sets it apart is that it tends to gain weight as countries move forward along their development path. Therefore, it may present an attractive choice for long-term development strategies in terms of employment generation.

Regarding sector (27) basic metals, in which Guinea has stronger industrial production and export capabilities, the employment generation is usually not very high, and although it is expected to somewhat increase for middle-income levels, it usually declines again in high-income countries. However, as shown in this chapter, basic metals can set the base for developing the sector of fabricated metals. With this productive structure unfolding, the country can move along different development stages, reaching a high-income position while still benefitting from employment creation.

Figure 2.16. Global Employment Projections



Source: Calculations based on (INDSTAT, 2020) and Penn World Tables 9.1 (Feenstra et al., 2015a).

Methodology described in Appendix B.1.4.

Note: Based on pooled cross-country data for up to 153 countries between 1963 and 2017. Income group cut-offs identified by the dashed vertical lines at USD 995, USD 3,896 and USD 12,375 as defined by World Bank Country and Lending Groups (World Bank, 2019c). The income level corridor Guinea is highlighted by the gray vertical stripe.

Results IV-digit sub-sector analysis

Table 2.3 shows that, based on other countries experiences at Guinea's current stage of income, the following IV-digit sectors have presented high employment generation projections: (3120) Electricity distribution & control apparatus, (1551) Distilling, rectifying & blending of spirits, (1810) Wearing apparel, except fur apparel, (2423) Pharmaceuticals, medicinal chemicals, etc, and (3430) Parts/accessories for automobiles.

Table 2.3. Employment projections, ISIC Rev. 3 IV-digits

ISIC Rev. 3, IV-digits sectors	Employment projection (x1000)
(15) Food and beverages	
(1551) Distilling, rectifying & blending of spirits	0.32
(1554) Soft drinks; mineral waters	0.19
(18+19) Wearing apparel	
(1810) Wearing apparel, except fur apparel	0.31
(1912) Luggage, handbags, etc.; saddlery & harness	0.09
(23) Coke, petroleum and nuclear	
(2320) Refined petroleum products	0.13
(2310) Coke oven products	0.05
(24) Chemicals	
(2423) Pharmaceuticals, medicinal chemicals, etc.	0.30
(2412) Fertilizers and nitrogen compounds	0.17
(26) Non-metallic minerals	
(2694) Cement, lime and plaster	0.13
(2610) Glass and glass products	0.08
(31) Electrical Machinery	
(3120) Electricity distribution & control apparatus	0.87
(3190) Other electrical equipment n.e.c.	0.44
(34) Motor vehicles	
(3430) Parts/accessories for automobiles	0.22
(3420) Automobile bodies, trailers & semi-trailers	0.03
(35) Transport equipment	
(3511) Building and repairing of ships	0.06
(3599) Other transport equipment n.e.c.	0.02

Note: makecell!!! ISIC Rev. 3 IV-digit industries, selected years. Projected employment/population ratio (x1000) based on 2017 real GDP per capita.

2.4. Summary of section 2 and implications for the industrial policy project

The meso-level analysis revealed that the industrial production and export capacity of the manufacturing sector in Guinea today is overwhelmingly concentrated in the basic metals and food, beverages and tobacco sectors. The national and international import dynamics, as well as the comparison of the country's exports with benchmarking countries, identified several sectors as potential avenues for the country's development. Most of these potential sub-sectors belong to or are strongly related to the basic metals or food and

beverages sectors. Therefore, developing new activities within these sectors seems to be a promising path for Guinea's future.

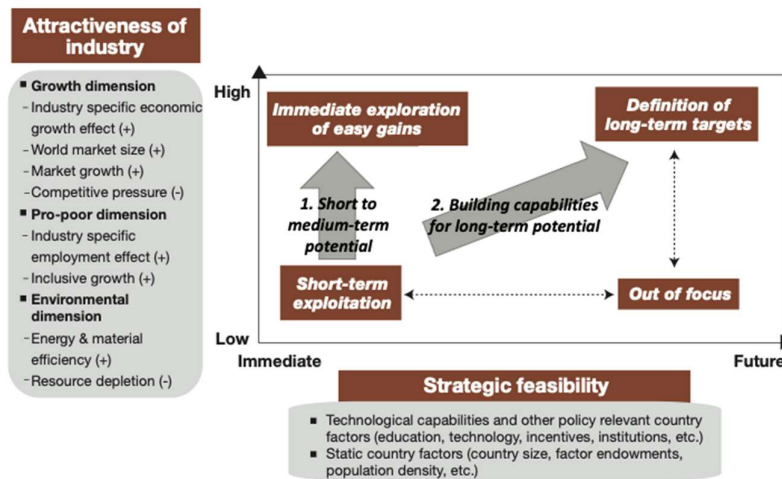
A viable way of doing so is deepening the value chain of existing activities where there are relevant production capabilities. For instance, taking advantage of the large bauxite production to advance to downstream segments of the aluminum value chain, which generate greater value-added, require more qualified workers, and have stronger linkages with the rest of the economy than the mining activities. Gradually, Guinea could build capacity to manufacture alumina and primary aluminum, and target finished aluminum products and other sectors directly linked to its value chain as a long-term development strategy.

The agro-processing industry is also another potentially good opportunity to foster socioeconomic development in the country, by not only developing the food industry, but also more sophisticated sectors such as packaging materials, animal feed production, irrigation equipment, tools, manufacture or assembly of simple tractors, production of agrochemicals (fertilizers, pesticides, among others), etc.

These possibilities are aligned with Guinea's National Development Strategies. The National Development Vision 2040 and its implementation tool the National Economic and Social Development Plan (PNDES) 2016 – 2020 recognize the need to go beyond the pure primary production and stress the importance to integrate the mining sector into the economy. Also, the recently established "Special Agro-Industrial Processing Zones Programmes" aims at fostering the agro-processing industry by developing 10 agro-industrial parks for the processing of raw material in the country. However, despite all these efforts, the plans lack clear selection and targets to do so.

UNIDO's industrial policy support project in Guinea should pay special attention to the importance of sub-sectoral development potentials. In particular, it is advisable to dig deeper into the potential priority sectors identified in this chapter in order to arrive at a final list of focus sectors which are chosen in a participatory process with all key stakeholders. Defining the concrete short/medium-term as well as long-term focus sectors should hence consider the relative attractiveness of sectors (as analyzed in this chapter and summarized in figure 2.1 at the beginning of this chapter), as well as the strategic feasibility of entering the new sectors, as illustrated in figure 2.18. The process for selecting priority sectors should thus be based on a realistic assessment of Guinea's current industrial capabilities in order to identify which sectors are feasible in the short and medium term and which sectors will require a more significant development of new human and technological capabilities, and hence are more suitable for the longer term.

Figure 2.17. Framework for definition of short and long-term priority sectors



Source: Illustration adjusted based on UNIDO & UNCTAD (2011): Economic Development in Africa Report 2011: Fostering Industrial Development in the new Global Environment.

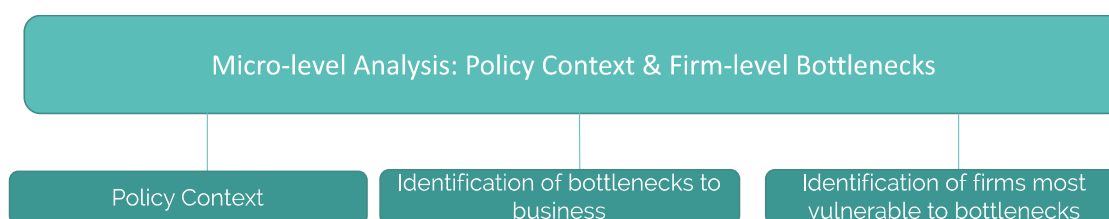
The priority sector selection process should also critically reflect on the respective sectors potential to contribute to addressing the big socio-economic issues in the country, such as food security, poverty alleviation, infrastructure improvement (especially transport, telecommunications, and energy), housing and health access, and creation of better jobs. In a next step, clear targets for the development of the selected industries have to be set, detailed sectoral action plans of policy interventions should be developed and an in-depth sectoral monitoring and evaluation system to keep track of progress needs to be operationalized.

To foster the development of the mentioned industries, the Government must put forward a comprehensive and coordinated range of industrial policy interventions that can facilitate and stimulate the flourishing of more advanced industrial activities in the sectors. Within this policy package, it is crucial to address the country's bottlenecks by building productive capabilities, transport infrastructure, and in particular upgrading the energy system. The role of foreign direct investment will probably remain crucial for the process; however, it needs to be ensured that investors comply with the country's development strategy and that their activities benefit Guinea's society.

3. Policy context and bottlenecks to business

This section is dedicated to the assessment of Guinea's governance and policy-making capabilities in general and the identification of obstacles to the development of the manufacturing sector in particular. Where possible the report distinguishes characteristics of firms most vulnerable to the identified bottlenecks. Figure 3.1 illustrates the structure of the section.

Figure 3.1. Micro-Level Analysis Structure



Source: UNIDO - GPI

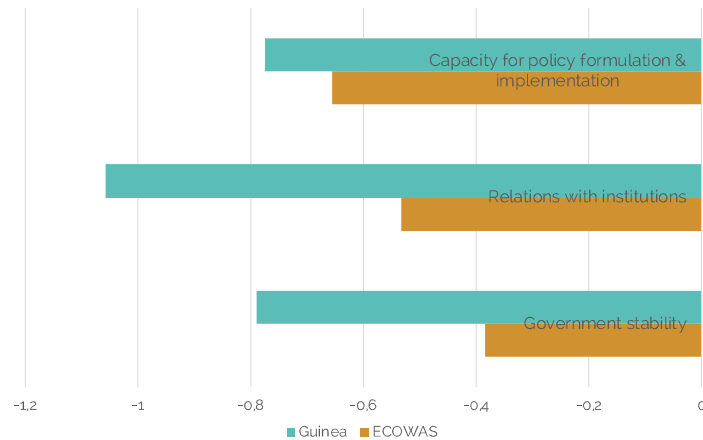
3.1. Policy context

This sub-section will examine Guinea's governance and policymaking capabilities. The first part of the section will analyze i) the overall governance in the country, to provide context and ii) the policymaking capacities and the outcomes of these, by assessing whether there is a conducive business environment for the private sector. Lastly, a section covers the industrial policymaking process in Guinea.

3.1.1. Governance

To provide an overall picture of the governance performance of Guinea, the World Bank Worldwide Governance Index is analyzed and compared to the ECOWAS average in 2019. This index uses a range of national and international sources of information such as multilateral organizations, think tanks, business and firm surveys as well as NGOs. It is important to understand that these indicators are perception-based and therefore need to be interpreted cautiously. Allowing for a score between -2.5 (weak) to 2.5 (strong), the analysis is divided into three topics, each comprising of two indicators. To obtain a score for each topic, an average of the two indicators' scores was taken.

Figure 3.2. Governance Indicators Guinea vs ECOWAS 2019



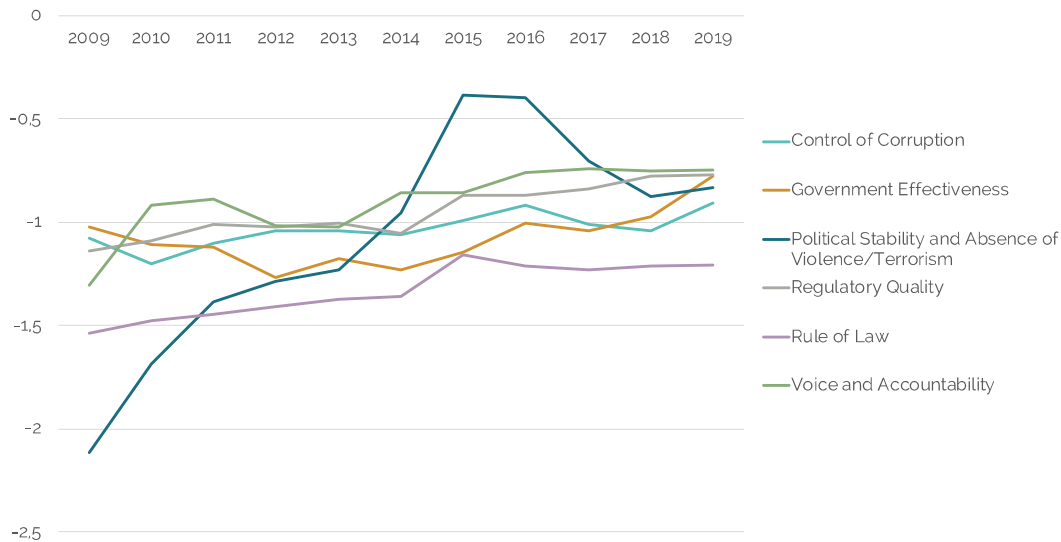
Source: Worldwide Governance Index (World Bank).

Figure 3.2. illustrates that both ECOWAS and Guinea reported subzero scores in all indicators. In the indicator, "Capacity for policy formulation and implementation", Guinea performed close to the ECOWAS average with a score of -0,7 and -0,6 respectively. With regard to the relations with institutions, which includes the rule of law and control of corruption, Guinea's performance is by far below the average of ECOWAS, with a value of -1. This is the weakest indicator for Guinea based on this index and it corresponds with the main bottlenecks for businesses which are further discussed in block 3. Finally, government stability, which measures government effectiveness and regulatory quality, shows that based on the perception of the population the performance of the government under these topics is still fragile and significantly below the ECOWAS average.

Figure 3.3 shows the historic trend of some of the most relevant governance indicators for Guinea. Political Stability and Absence of Violence has improved significantly in the last decade, and it reached almost a zero level between 2015 and 2016. Control of corruption is also a matter of concern for the population and the government efforts seem to have improved the perception of the audience somewhat, specifically through public engagement, by increasing citizen control of public action and strengthening the capacities of local actors. In this respect, the National Policy Letter on Decentralization and Local Development (LPNDDL) aims at enhancing the role of local governance in the decision-making processes by strengthening the decentralization process.

The implementation of PNDES 2016-2020 through Pillar 1 has possibly made a lot of progress in this regard. The main lines of actions were strengthening the rule of law and access to justice, promoting governance involvement among the population, reinforcement of the security and civil protection and investing in social cohesion through various programs. Overall, all indicators used by this index seem to be improving over time, nevertheless transparency and accountability remain key for further improving the business environment in the country.

Figure 3.3. Guinea's Governance indicators 2009-2019



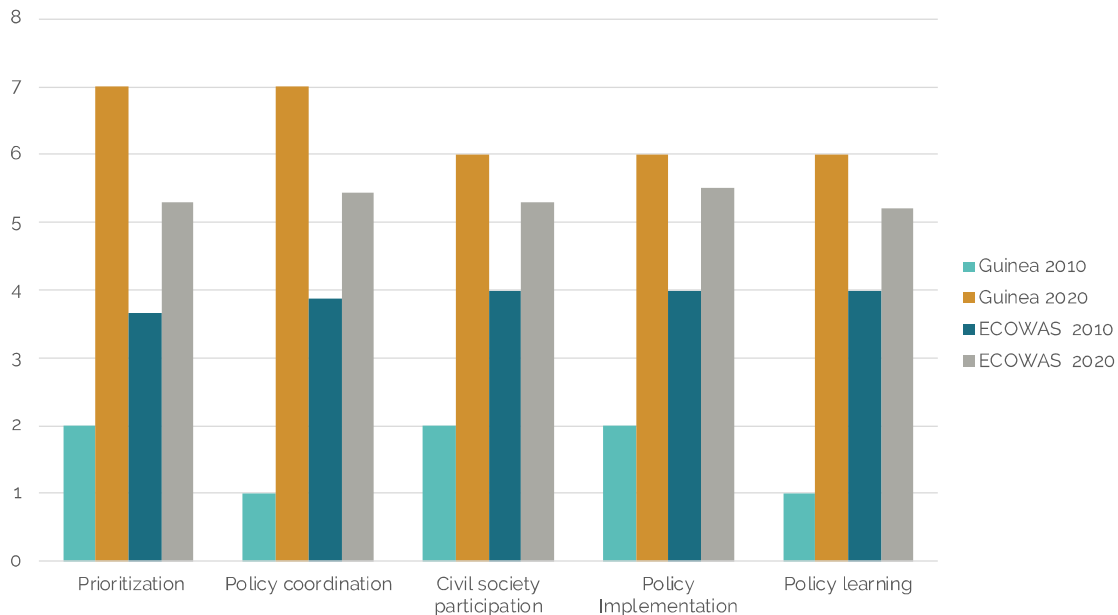
Source: Worldwide Governance Index (World Bank).

Based on the World Bank Systematic Country Diagnosis developed in 2018, Guinea’s governance challenges are present in all the governmental levels and are cross-sectoral in nature. The public sector performance is the driver of economic development – hence, strengthening the government capacities for decision making will reduce many of the bottlenecks for achieving the development goals of the country. Poor governance capacities have ripple effects on the economy and across sectors. This is particularly relevant for Guinea as institutional weaknesses can cause social fragility and lead to mismanagement of natural resources,^{lxiv}

3.1.2. Policy-making capabilities

To assess the policy capacities of Guinea, the Bertelsmann Transformation Index (BTI) is analyzed. BTI is developed based on the expertise of national professionals, that, through a systematic and standardized process, assess 17 criteria in the country. These criteria aim at understanding whether or not the country is moving towards democracy and market improvement.^{lxv} Figure 3.4 shows a selection of the 5 most relevant indicators to assess policy capacities in 2010 and 2020 for Guinea and the ECOWAS average. Overall, Guinea has not only significantly improved the scores of all indicators within the analyzed period but its performance is higher than that of the ECOWAS average across the board. While the ECOWAS average in policy prioritization was 5 in 2020, Guinea managed to increase from 2 points in 2010 to 7 points in 2020. Policy coordination shows by far the biggest achievement, as the country went from 1 point to 7 points over a decade. Civil society participation, policy implementation and policy learning also improved significantly to 6 points in 2020.

Figure 3.4. Guinea's policy-making capacities (score 1=lowest 10=highest)



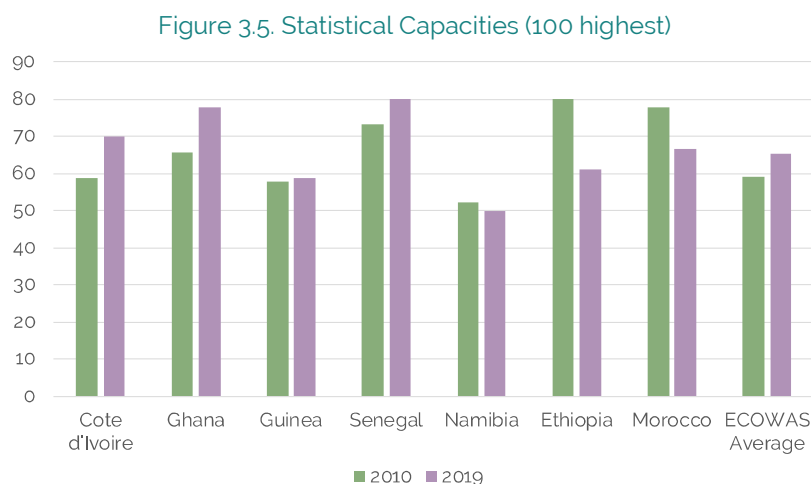
Source: Bertelsmann Stiftung Transformation Index.

Overall, these findings indicate significant improvements of Guinea's policy making capabilities, which presents an opportunity for implementing an effective industrial policy that can drive the process of structural transformation in the future. A participatory and goal-oriented approach to policy design and implementation will ensure that the decisions, priorities and actions developed by the government are shared by the audience. Public consultations with the main stakeholders as well as civil society is essential for a transparent process. Within this process, the coordination with relevant ministries will determine the success of any policy and improve the harmonization of all policies to achieve the national development goals. Last but not least, establishing a solid monitoring and evaluation system will improve the overall policy capacities. Experimenting, learning and adapting is key for a sustainable policy process.

3.1.3. Statistical capacities

Access to robust statistics is the basis for evidence-based decision making. Statistical capacities tend to be a common challenge in developing countries, as the collection process and management of data tends to require a considerable number of resources. Guinea's statistical capacities are among the lowest compared to its peers and the ECOWAS average (Figure 3.5.) and do not show much improvement in the recent period. In 2010 Guinea received a score of 57.7 while in 2019 it reached 58.8. In this respect, Guinea may be able to learn from the successful experiences of Ghana and Senegal that improved their capacities significantly over the last decade and now reach scores around 80 points. Consultations with country stakeholders revealed that in the past, experts have rated the quality of the industrial statistics extremely low.

The challenges related to data collection are mainly due to the lack of qualified human resources; for example, real statisticians are almost non-existent. There is also the urgency for financial and material resources.



Source: Statistical Capacity Indicators (World Bank).

Based on a study developed by the World Bank in 2018, the last national firm-level survey that was conducted by the national statistics office was in 2006 (World Bank 2018). Manufacturing data, especially including SMEs, is extremely limited and not properly disaggregated. As expressed during the consultations, the last manufacturing specific survey was developed 5 years ago. Hence, conducting an industrial census and annual industrial surveys should be seen as a key priority to upgrade the industrial policy process of Guinea. Household surveys and employment surveys should also be a priority as this will allow to understand the nature of the labor market and will serve as a basis for strategically targeting the appropriate policy instruments. Having access to environmental and climate change data is crucial for an agricultural country, as the impacts of climate change need to be addressed in an urgent manner, and to do so, reliable data and inventories need to be developed. Last but not least, any statistical work needs to carefully include the informal sector, which accounts for a large share of the economy and labor market today.

Strengthening the capacities of the National Statistics System is indispensable in order for data to be collected regularly and ensure it complies with international standards. Based on the PNDES Report 2019, the migration into the new System of National Accounts (SNA) has been started and it is expected that this will allow to have reliable macroeconomic aggregates to better evaluate the national wealth by making the GDP more accurate. Efforts to improve the access to national statistics have already been implemented through the modernization of the INS website. It would be of key importance for the industrial policy process to make similar progress with regard to industrial statistics.

Consultations revealed that the data coverage of the industrial statistics is very low. Only around 100 companies responded in the last yearbook. Likewise, it is concluded that stronger collaboration between the Ministry of Industry and the INS is essential as both agencies work independently from each other and efforts being made by the Ministry are not necessarily communicated to INS and vice versa. The statistics agency should play a key role in the design, implementation and Monitoring and Evaluation of the industrial policy, and it is based on the efficient collaboration between these institutions that baselines and industrial policy targets can be set.

3.1.4. Capacities for industrial policy

As the consultations pointed to significant capacity gaps, a crucial success factor for effective industrial policy is the systematic enhancement of industrial policy capabilities in Guinea. In this respect we can broadly distinguish between capabilities on the individual, organizational and system level as illustrated in figure 3.6. Individual capacity development support could target policy professionals from the public and private sector on the technical, executive and political level. Given the limited prior exposure to industrial policy in the country, a comprehensive approach should be pursued, including the strengthening of analytical skills for conducting industrial diagnostics, knowledge transfer on policy processes and key instruments for the design of an Industrial Strategy and Policy package, managerial skills for action planning and implementation as well as specific tools and methods for policy monitoring, evaluation and adaptation.

Figure 3.6. Key dimensions of industrial policy capacities

	1. Industrial analysis stage	2. Industrial Strategy design and agenda setting stage	3. Industrial Policy design stage	4. Industrial Policy implementation stage	5. Industrial Policy monitoring, evaluation and adaptation stage
A. Individual level	Technical capacities and managerial expertise of industrial policy professionals, both in the public sector (incl. analysts, directors, ministers) and private sector (incl. analysts and managers in industry associations)				
	1) Data generation & analytical skills	2) Technical knowledge about policy processes and instruments 3) Skills in policy analysis and priority setting		4) Action planning & managerial skills	5) Monitoring tools, evaluation methods, experimentation
B. Organizational level	Institutional capacities in particular: 1) Ministry of Industry and SMEs: available personnel (number and qualification), and financial resources for policy implementation and M&E. Strong role & influence within cabinet.				
	2) National Statistics office (INS): Capacity for industrial surveys	3) Industry associations: inclusive representation of private sector companies. Effective communication of challenges and opportunities for companies. Project implementation capacities.			
C. System level	1) Support for industrialization within the country, in particular with respect to the prioritization of industrialisation in the national development agenda, on the highest level of political leadership and within society				
	2) Effective inter-institutional cooperation between key line ministries (e.g. Industry, Mining, Trade, Energy, Finance)				
	3) Transparent public-private dialogue & cooperation. Minimized political influence of individual companies				

Source: UNIDO - GPI

On the organizational level, the institutional capacities of the Ministry of Industry and SMEs need to be strengthened both with respect to the availability of a sufficient number of well qualified staff as well as sufficient financial resources for implementing policy interventions and conducting M&E processes. Support with respect to the role and relative influence of the Ministry within the cabinet could focus on the strategic communication of the central role of the manufacturing sector and industrial policy for the transformation of

the economy. Given the current lack of industrial production data, strengthening the National Statistics agency (INS) in the execution of industrial surveys is another crucial element. Industry associations could be supported with respect to their ability to represent the industrial private sector effectively in the policy process by communicating the key challenges and opportunities during the policy design, but also with respect to their capacities for implementing support projects in the implementation stage.

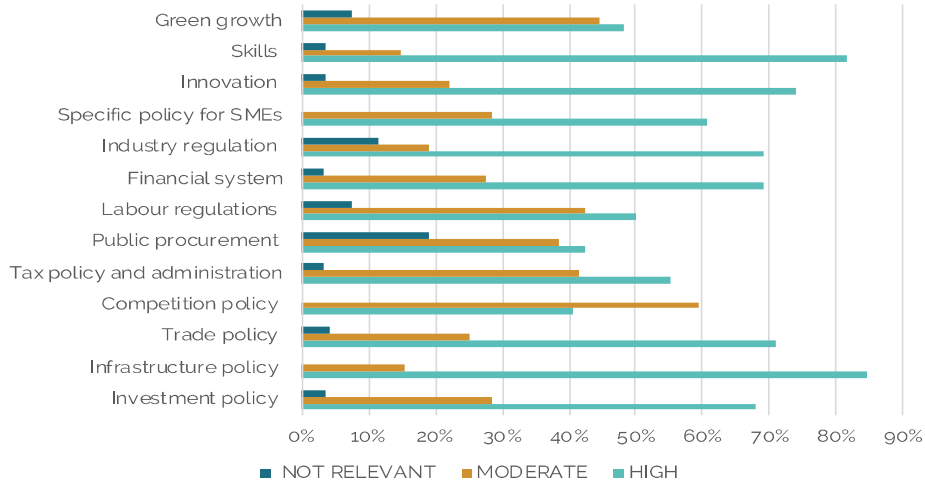
Finally, on the system level, it will be important to highlight the crucial role of industrial policy for the inclusive and sustainable development of Guinea in order to win the support of the political leadership as well as society at large. In a next step, strengthening inter-institutional collaboration is particularly relevant to ensure an effective coordination with the Ministries of Mining and Agriculture with respect to a value addition strategy in the basic metals and agro-processing sectors. A harmonious collaboration with the functional ministries for energy, trade and finance is of equal importance in order to effectively implement specific industrial policy instruments in a coordinated manner.

While the current capacities for industrial policy making require significant enhancements, the development of dynamic capabilities offers a way for the Guinean Government to play a more proactive role in tackling the large industrialization challenges in the country in the future. In this respect, it is advisable to pursue a careful "learning-by-doing" approach, which starts with a somewhat less complex industrial policy design that selectively prioritizes only a small number of feasible industrial policy interventions. The dynamic capabilities of the public sector will then be enhanced through a process of continuous improvement through experimentation, which will allow the stepwise accumulation of systemic resources and abilities as well as effective routines and capacities for implementation.

BOX: 3.1. PERSPECTIVES OF THE PRIVATE SECTOR: INDUSTRIAL POLICY

100% of companies consulted through the UNIDO Guinea Firm level Survey 2021 agreed that there is a need for a comprehensive Industrial Policy in the country. 90% acknowledged that the manufacturing sector is highly important for Guinea to continue climbing up the development ladder. Figure 3.7 illustrates that over 80% of consulted companies believe that infrastructure should be the focus of the Industrial Policy, which confirms the findings of the World Bank Enterprise Survey. Companies also agree that skill development and innovation capabilities are key components for an effective policy followed by trade and investment which are perceived as challenges that should be addressed by an appropriate strategy.

Figure 3.7. Industrial Policy Potential Focus

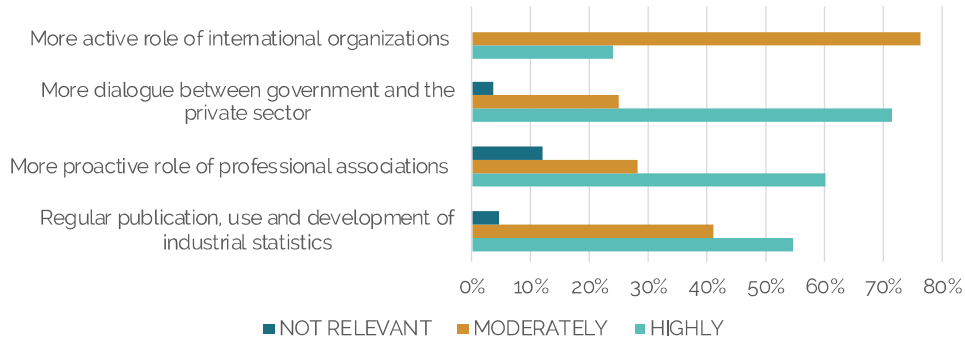


Source: UNIDO Guinea Firm level Survey 2021

Note: Shares are calculated based on the number of responses (29 answers)

Moreover, over 70% of the companies believe that strengthening Public-Private dialogues would highly benefit the industrial policy processes and support the promotion of the productive sector. Companies also see an opportunity through the enhancement of professional associations' roles in the industrial policy development. Finally, over 50% of the companies that answered understand the need for better industrial statistics, for both the collection and dissemination of relevant data.

Figure 3.8. Initiatives that would improve the industrial policy process to promote private sector



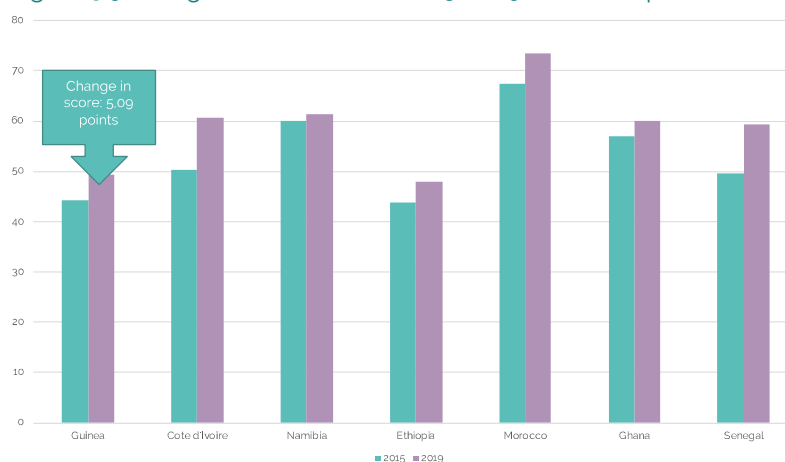
Source: UNIDO Guinea Firm level Survey 2021

Note: Shares are calculated based on the number of responses (29 answers)

3.1.5. Doing Business in Guinea

Despite Guinea's political history and fragility, there has been a significant improvement after the democratic transition in 2010. This can be understood by analyzing the changes in the Doing Business Scores developed by the World Banks as a proxy to measure the impact of regulations on businesses. Figure 3.9. shows the scores by country in 2015 and 2019. Guinea has increased its score by 5.09 points. In 2019, Guinea's score was 49 out of 100, which however is still below most of the benchmarking countries and only slightly above Ethiopia. The government has undertaken a series of reforms to improve the reputation of the country and attract FDI. For example, in 2011 the Mining Code brought clarity to the legal procedures related to the extractive sector. Climate investment reform programs such as the creation of the Private Investment Promotion Agency (APIP), the elaboration of the National SME Policy letter and the establishment of a Public-Private Dialogue Secretariat and the Private sector Consultation Platform have helped the country to regain external confidence.

Figure 3.9. Doing Business Scores 2015-2019 (100: Best performance)

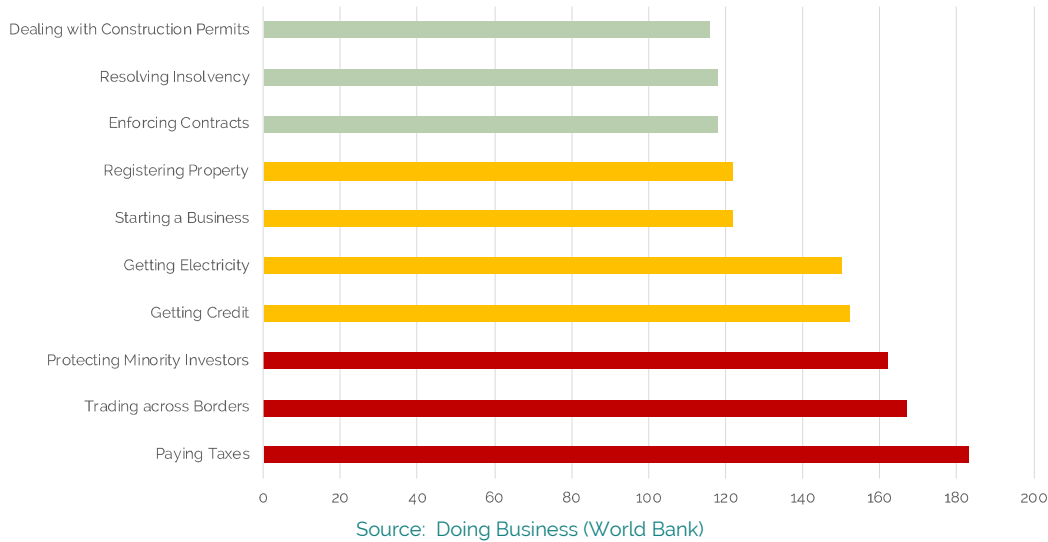


Source: World Development Indicators (World Bank)

When it comes to the Doing Business Rankings, Guinea has managed to increase its position after spending many years close to the bottom. In 2019, Guinea can be found on rank 156 out of 190 economies. Although this is still far from ideal, the increase from rank 169 in 2015 indicates a business environment improvement. The PNDES 2016-2020 target was to achieve rank 150 in 2020, which has not been accomplished fully yet. Figure 3.10. shows the main 10 topics for Guinea and the ranking out of 190 economies. Paying Taxes (183) Trading across Borders (167) and Protecting Minority Investors (162) are the most challenging issues for businesses in the country. The main constraints within Paying Taxes are the high rates and lack of transparency of tax payment systems.^{lxvi} Getting Credit (152), Access to Electricity (150), Starting a Business (122) and Registering Property (122) are also a matter of concern for private sector development. Further issues that still require the governments attention but are comparatively less problematic are Enforcing Contracts (118), Resolving Insolvency (118) and Dealing with Construction Permits (116). To tackle these issues the government has among other measures, reduced the fees for starting a

business, improving the administrative system for accessing permits, and reducing the property transfer fee.

Figure 3.10. Guinea’s ranking in Ease of Doing Business by its 10 topics (out of 190 economies)



3.2 Bottlenecks to business

This section of the report identifies the key bottlenecks to Guinean manufacturers for their overall business activities. Bottlenecks are defined as problems related to factors that exert a negative impact on the performance of private enterprises and their ability to create value added and jobs. These may consist of limited access to required material inputs, to capital and labor, or aspects belonging to the general business environment like institutional shortcomings. Additionally, this section identifies - where possible - types of firms that are most affected to different bottlenecks.

The analysis of bottlenecks is based on a combination of firm-level data from the World Bank Enterprise Survey (WBES), the UNIDO Guinea firm – level Survey 2021, consultations with Guinean stakeholders (ministries, private sector representatives, development agencies), as well as relevant online resources, academic literature, reports from international organization and statistic data from various sources. Likewise, the findings resulted from UNIDO’s survey shows the perspective of the private sector in numerous bottlenecks.

Identifying the most important bottlenecks is based on the following approach: First, data from the World Bank Enterprise Survey is analyzed. Bottlenecks are being identified that were most frequently stated by the surveyed firms to either be severe or major concern.¹³

¹³ In the survey firms can answer with 'no obstacle', 'minor obstacle', 'moderate obstacle', 'major obstacle' or 'very severe obstacle' when asked if a particular issue constitutes an obstacle to their

Whenever possible and available, related follow-up questions from the survey are analyzed to provide further context. Second, given the very small size and the lacking representativity of the sample for the Guinean manufacturing sector, this analysis is supplemented by an extensive desk research to (i) identify potentially additional major bottlenecks, (ii) enhance the contextualization by further evidence and (iii) re-weight the relevance of the identified bottlenecks. Third, consultations with local stakeholders are conducted. The consultations are based on a semi-structured interview design with an open session to ensure that all relevant bottlenecks are being identified and confirmed followed by in-depth discussion of the respective topics. The combination of evidence from these different sources ensures the identification of the key bottlenecks faced by Guinean firms.

The applied three-staged approach has proven robust as it produced consistent results. The desk research (i) confirmed the major bottlenecks identified by the ES and (ii) added two additional bottlenecks that appeared to be of high relevance. The open collection of bottlenecks at the beginning of each consultation showed high consistency by revealing the same set of bottlenecks as identified in the desk research.

Step 1 of the analysis is based on the latest survey conducted by the World Bank Group in their series of Enterprise Surveys in 2016. The sample is relatively small as only 27 manufacturing firms in Guinea are included. Important to note is that only registered firms are surveyed while the majority of manufactures still operate informally (see section 3.4.1 on informality). This goes in line with a bias towards companies located in the capital Conakry, hence, misrepresenting potentially impediments companies in other, rural areas face.

Where possible, data for Guinea is benchmarked against relevant comparators to highlight the relative importance for or performance of the manufacturing sector. The ES data is compared to Guinean non-manufacturing firms as well as to the average ECOWAS manufacturing firm. The chosen benchmark countries are part of the ECOWAS region. However, in this section only countries with surveys not older than 2010 were considered to allow for a comparable time horizon. Whenever data from the benchmark countries is available, we do not compare the results of Guinea to all countries individually but one column in the tables ('Manufacturing ECOWAS') reports the results of manufacturing firms in ECOWAS countries as a group.¹⁴ In addition, the analysis distinguishes Guinean large and small/medium sized enterprises (SMEs), domestic and foreign owned firms, and exporting and non-exporting firms to highlight further more granular distinctions of the severity of the reported bottlenecks.¹⁵ The industry classification adopted in this part of the study considers low tech and medium-low vs. medium-high and high tech.¹⁶

business(es). Key bottlenecks are defined as all obstacles that were listed as being either a 'major obstacle' or a 'very severe obstacle' by the responding firm. A complete list of questions of the Guinean World ES (2016) is provided in Appendix C

¹⁴ This grouping is done because many countries' surveys have relatively few observations (see Table C.1

¹⁵ SMEs: 1-99 employees, foreign owned: more than 50% foreign owned, exporting: firms with a share of direct and indirect exports bigger than zero

¹⁶ The corresponding ISIC Rev. 3 II-digit industry classification can be found in Appendix A

Whenever interpreting results for a specific group of firms, the distribution of firm characteristics should be considered as there are relatively few observations for most of them. Table 3.1 shows how the 27 firms can be grouped into subgroups.

Table 3.1. Firm Distribution 2016 Survey

	Total	Technological group		Market		Size	
		LT	MHT	Domestic	Foreign	SME	Large
All manufacturing firms	27						
LT	21						
MHT	6						
Domestic	25	20	5				
Foreign	2	1	1				
Large	3	3		2	1		
SME	24	18	6	23	1		
Exporter	5	4	1	5		5	
Non-exporter	20	15	5	18	2	19	1

Data Source: World Bank Enterprise Survey Guinea (ES, 2016).

Note: Manufacturing firm characteristics. Reading example: Of the 27 manufacturing firms, 25 are domestically owned. Of those, 2 are large, 23 are small or medium sized. LT: Low Tech, MHT: Medium High Tech, SME: Small and Medium Enterprises.

3.3 Overall results

The overview of the topics firms viewed as either major or very severe obstacle in the World Bank Enterprise Survey can be found in Table 3.2. The six topics that were named most by manufacturing firms are highlighted.

In relative numbers, Guinean manufacturing firms stated that the Informal sector (70%), Political Instability (59%), Corruption (52%), Electricity (44%), Transportation (44%) and Tax administration (41%), were the biggest obstacles in 2016. Besides Electricity, these numbers are all higher compared to the respective values for the average ECOWAS manufacturing firm. The top six key bottlenecks remain almost the same when considering all Guinean firms (manufacturing and services) in the 2016 survey.

Table 3.2. Firm Bottlenecks

	Guinea		ECOWAS	
	Manufacturing	Non-Manufacturing	Manufacturing	Non-Manufacturing
Access to finance	26%	33%	39%	42%
Access to land	11%	15%	29%	29%
Busin. License and permits	4%	10%	13%	13%
Corruption	52%	25%	38%	43%
Courts	11%	12%	10%	13%
Crime	33%	34%	15%	22%
Customs	37%	40%	16%	23%
Electricity	44%	29%	60%	46%
Inadequate skilled labor force	22%	12%	15%	16%
Informal sector	70%	39%	32%	35%
Labor regulation	19%	13%	9%	9%
Political instability	59%	72%	25%	31%
Tax administration	41%	34%	25%	28%
Tax rates	26%	33%	29%	36%
Telecommunication	7%	28%	11%	15%
Transportation	44%	37%	23%	24%

Source: World Bank Enterprise Survey 2016

Note: Share of manufacturing firms that stated a topic as "very severe" or "major obstacle". Numbers always refer to the respective subset (column). The top six bottlenecks for manufacturing firms are highlighted in bold.

Three of the top six bottlenecks (corruption, tax administration and political instability) belong to the realm of governance. This fact underlines the significance of impediments to effective state-business relations in Guinea. The desk research and consultations revealed that the absence of a comprehensive industrial policy based on consultations with the private sector must be included as the fourth major governance bottleneck.

Two identified bottlenecks (transportation, electricity) refer to infrastructure. Infrastructure in its entirety is a crucial external factor to successful industrial development. And, it is highly related to governance as it shows the capability of the government to create and sustain the infrastructural conditions needed to develop the manufacturing sector.

Finally, the remaining bottlenecks can be aligned to the factors of production (land, capital, labor, entrepreneurship, technology) as the immediate inputs into the productive process. The bottleneck informality has been rated the highest as the numerous presence of unregistered companies causes a significant distortion of competition. Informality, however, must be understood as a general obstacle to effective factor market development. The desk research and consultations also one additional bottleneck in the realm of factors of production. Access to finance is not highly rated in the ES but appeared

in other, more recent studies and in the consultations to be of fundamental importance for the development of the manufacturing sector.

The following section will discuss these bottlenecks in the areas of Factors of Production, Infrastructure and Governance in greater detail.

3.4 Bottlenecks in factors of productions

Industrial development is a dynamic process and can focus, among others, on improving product quality, increasing the efficiency of production or on establishing new industries in a country. In order to enhance industrial production changes in the underlying production factors, the inputs into the production process are needed. Increasing the quality of a product may require the application of new technology. Establishing new factories require investments. Lacking access to skilled labor, specific technologies, finance, raw materials or any other factors of production may constitute significant bottlenecks to industrial development in a country. Depending on the respective stage of development of a country and the envisioned changes, these bottlenecks can be of various nature.

The level of industrial development, in particular of the manufacturing sector, is very low in Guinea (see chapter 1 and 2). The goal is to establish basic secondary industries that can process existing raw materials in the country. In the area of production factors two major obstacles have been identified that hinder industrial development: (i) informality and (ii) access to finance.

3.4.1 Informality

Among manufacturing firms in Guinea 70% named informality (table 3.2) as a major or very severe obstacle for their business activities. Therewith, informality is by far the most outstanding obstacle. Informal economic activities are part of any economy. However, if they occupy a dominant share of the overall economy this can be a significant impediment for development. Dominating informality is a common feature across most Western African economies.^{lxvii} However, this seems to be of particular importance in Guinea as in average in the ECOWAS region only 32% named informality as a major or very severe obstacle (table 3.2).

Roughly 50% of the overall value added is created in the informal economy, which also accounts for more than 70% of total employment in Guinea. The service sector is traditionally more vulnerable to informality (64% of its value added) but, interestingly, also the manufacturing sector is highly dominated by informal industrial activities (68.5%).¹⁷ Informality applies to companies without distinction of size and across subsectors. Informal companies exist and operate in various forms: as single producer operating by himself or with his family; as an association or co-operative without legal documents or

¹⁷ Several branches of activity are highly dominated by informal activities such as trade (87.1%), hotels (96.8%), transport and telecommunications (77%) (PNDES 2016-2020)

proper registration or as a registered company that operates informally due to the absence of proper accounting procedures.^{lxviii}

The informal sector is characterized by its disregard of regulations and non-compliance to given administrative requirements. Informal production may ignore rules and standards with respect, for instance, to labor legislation, product quality and safety or environment protection. If informal suppliers occupy a significant market share, this leads to a distortion of competition where formal companies are barely able to offer their products at competitive prices.

In Guinea, 59% of surveyed (formally registered) companies state that they compete against unregistered or informal firms, which is slightly higher than the average 55% in the ECOWAS region (Table 3.3.). Facing competition with informal companies does not automatically mean that this presents a significant obstacle to business development. The majority of companies in the ECOWAS region compete with informal firms, however, only for one third informality is a major issue (table 3.2.). Hence, it is the size of the informal sector that defines the competitive pressure on the formal sector, which is obviously higher in Guinea than in the overall region.

Table 3.3. Share of firms that compete with informal sector

	Guinea		ECOWAS	
	Manufacturing	Non-Manufacturing	Manufacturing	Non-Manufacturing
No	22,2%	23,6%	34,6%	33,2%
Yes	59,3%	57,7%	55,4%	59,7%
Not available not known	18,5%	18,7%	10,0%	7,1%

Source: World Bank Enterprise Survey 2016

Note: Share of (non-)manufacturing firms in Guinea and ECOWAS responding to bottleneck (columns sum up to 100%).

Answers to the World Bank Enterprise Survey question: Does this establishment compete against unregistered or informal firms?

This unfair competition can compel formal companies to closure or re-informalization of its operation as being observed for the textile sector.^{lxix} As the consultations confirmed, it is common practice that formal enterprises operate informally to benefit from cost advantages such as non-payment of taxes. The lacking documentation of the nature of a company, makes it difficult even for state procurement to understand if a company is formally or informally operating. Similar conclusions were drawn from Guinea’s Firm-level Survey 2021, where almost 90% of the consulted companies agreed the unfair competition of the informal sector is the most pressing issue.

Beside competition among local producers, another form of unfair competition exists, where informal traders import products to resell them at a lower cost on the local market. This circumvents trade barriers Guinea is using to protect its infant industries. Going or remaining informal might be a short-term strategy, that allows companies to compete. However, from a long-term development perspective, the competitiveness of Guinean

manufactures has to be increased by controlling the costs of production factors. Persisting informality impedes this process from happening.

Besides distortion of competition, informality causes other adverse effects on industrial development in Guinea. First, companies without proper registration lack access to finance through the banking system (see next section). Second, informal companies may create plenty of job opportunities. However, they often lack the social and safety benefits formal employments can offer. Third, local processing units have difficulties with respect to product quality compared to the sub-region. Informality prevents companies from modernizing due to the above-mentioned lacking access to finance or being excluded from governmental support schemes. Fourth, the size of the informal sector negatively impacts the tax base and the government's fiscal room for maneuver due to forgone taxes.

Persisting informality is not only an obstacle to industrial development and functioning factor markets but also the result of and symbol for other existing shortcomings. Besides informal production as a survival strategy to compete in markets, there are other factors that impede the formalization of companies. First, illiteracy and a lacking understanding of the conditions and benefits of formalization among informal entrepreneurs. Second, given the generally low educational level dealing with documentation and other administrative requirements present a huge challenge for businesses. Third, companies lack the financial means to "afford" to formalize due to higher costs. And, fourth, corruption and other malpractices within the state administration cause distrust and the desire to keep the business separated.^{lxx}

The Guinean government acknowledges the importance of the informal sector for the overall economy. The government has made critical efforts to reduce informality, inter alia, by creating a center of informality management. Firms that belong to the center are granted various benefits including tax reductions up to 50 percent to keep them formal after formalization. Furthermore, the government provides professional training and teaches the benefits of formalization. The formalization allows companies to gain access to bank credits. The government is also setting up a social protection system adapted to the informal sector and has adopted the Uniform Act on Arbitration Law and the Uniform Act on Mediation promoted by the Organisation for the Harmonization of Business Law in Africa (OHADA) in order to support the formalization on the level of legislation.^{lxxi} Informality is a major obstacle to industrial development in Guinea and, at the same time, a result of other bottlenecks that will be discussed in the following sections.

3.4.2 Access to finance

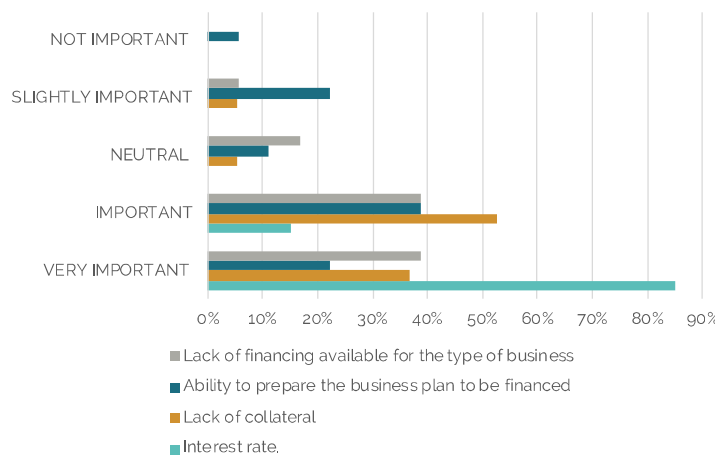
The development of the financial sector and thus the availability of finance is a prerequisite for facilitating sustainable economic growth. In general, investments play an important role for enhancing the productive capability of an economy through innovation, increasing efficiency (technology) and expanding production capacities. Not only for investments but also for every day liquidity management, lines of credit are an essential facilitator for all sorts of business activities.

According to the National Development Plan 2016–2020, access to financing has been identified as the key obstacle to private sector growth.^{lxxii} This has been confirmed by a recent study from 2020 stating that the cost of financing remains a significant obstacle. According to the survey 94 percent of companies express financing needs.^{lxxiii}

BOX 3.2: PERSPECTIVE OF THE PRIVATE SECTOR: ACCESS TO FINANCE

Similar findings resulted from the UNIDO Guinea Firm level Survey 2021 where 50% of the consulted companies classified access to finance as a very sever obstacle for their businesses. The main cause of this bottleneck according to the sample is the interest rate (85%), followed by the lack of collateral. (Figure 3.11)

Figure 3.11. Potential challenges to accessing finance



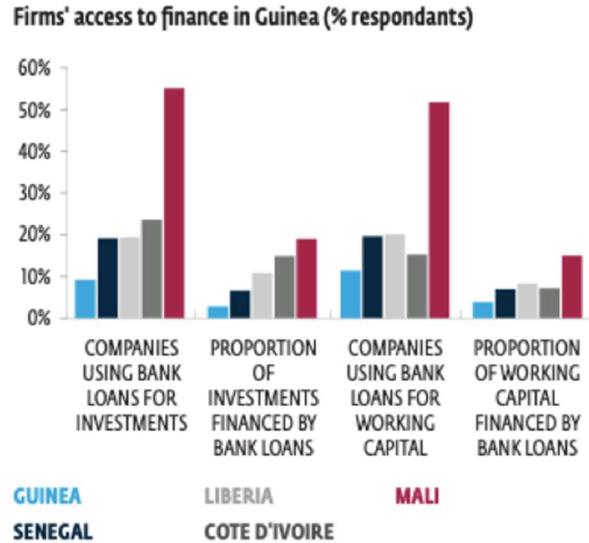
Source: UNIDO Guinea firm level survey 2021

Note: Shares are calculated based on the number of responses (20 answers)

Despite recent improvements, financial services in Guinea are still underdeveloped compared with regional peers. With similar GDP, Chad, the Republic of Congo, and Benin have banking sectors that are 2x, 4x and 6x, respectively, the size of Guinea’s. However, the situation is improving. Between 2010 and 2018, the number of banks in Guinea increased from 11 to 16, bank account penetration rates increased from 3.7 to 7.0 percent, and bank credit increased from 2.5 to 11 percent of GDP. This is still very low given the Sub-Saharan Africa average of around 45 percent of GDP.^{lxxiv}

The underdevelopment of the banking system is also reflected in a low penetration of the private sector in Guinea: More than 80% of companies do not possess a bank account.^{lxxv} Only 9% of companies use banks for finance and less than 4 percent of firms’ total working capital and as well as of firms’ investments are financed by banks (Figure 3.12).^{lxxvi} In all indicators, Guinea lags behind its neighbouring countries.

Figure 3.12. Access to finance indicators from IFC 2020



Source: IFC Report 2020

The limited relevance of the financial sector and the attractiveness of its products for industries can be attributed to a couple of characteristics of the Guinean banking system.

First, the consultations revealed that financial institutions failed to accommodate the manufacturing sector with industry-specific financial products. Long-term financing is virtually unavailable in the country which is indispensable for the acquisition and maintenance of machineries as essential components of the production processes. All banks in Guinea are commercial and not investment banks and, hence, lack experience and awareness of the needs of the industrial sector.

Second, access to finance is very expensive for Guinean firms. The average lending interest rate is 22 percent in Guinea, against a central bank rate of 12.5 percent. In comparison, lending rates are about 7 percent in WAEMU countries, and between 14 and 16 percent in neighbouring Liberia and Sierra Leone.^{lxxvii} The consultations mentioned a lacking cooperation between the government and banks, which may help to set up credit lines for industrial investments with a maturity of 5 to 10-years at subsidized rates. The survey from 2020 confirms that 85 percent of businesses believe that the interest rate for credits is an obstacle.^{lxxviii}

Third, collateral requirements are very high.^{lxxix} Collateral imposed by commercial banks is sometimes unrealistic to be met by companies. As confirmed in the consultations, often securities are required that exceed the value of the loan by a multiple.

Fourth, given the absence of specific programmes that grant access to banking products also to informal companies, the majority of manufactures is excluded from formal financing opportunities. Consultations also reported that companies face difficulties in the submission of applications due to lack of knowledge regarding the paper work and procedures, which results in the rejection of loans.

The IMF data^{lxxx} on access to finance reveals two interesting observations for Guinea that should be discussed in following. In general, the data shows that between 2015 and 2019

the banking system was not expanding relative to GDP. Outstanding deposits and outstanding loans remained relatively stable (Table 3.4.)

Table 3.4. Access to finance indicators from IMF

	2015	2016	2017	2018	2019
Number of ATMs per 100,000 adults	2.29	2.46	2.45	2.50	2.53
Number of commercial bank branches per 100,000 adults	2.78	2.75	2.76	2.78	2.71
Number of depositors with commercial banks per 1,000 adults	71.86	69.95	82.94	86.20	94.47
Number of borrowers from commercial banks per 1,000 adults	16.55	12.17	11.86	12.27	12.14
Outstanding deposits with commercial banks (% of GDP)	17.14	16.79	16.38	15.75	17.04
Outstanding loans from commercial banks (% of GDP)	9.54	9.11	8.15	8.14	9.58
Outstanding small and medium enterprise (SME) loans from commercial banks (% of GDP)	4.69	2.37	2.02	2.46	2.99
Number of registered mobile money agent outlets per 1,000 km ²	17.12	57.91	121.65	147.48	320.84
Number of registered mobile money accounts per 1,000 adults	156.57	257.70	346.21	489.82	598.23
Value of mobile money transactions (during the reference year) (% of GDP)	1.28	8.32	19.66	41.62	55.35

Source: IMF Financial Access survey

Within the same period of observation, mobile banking has developed rapidly in the country and managed to outperform the classic banking system by a multiple. By 2019 almost 60% of all adults were registered as mobile money users whereas less than 10% of adults held a bank account. The value of mobile money transaction grew from 1.28 % to 55.35% of GDP in 2019 which means that mobile money has become a dominant and widely used financial transaction means. Digital financial services (DFS) hold great potential. A new Financial Inclusion Law (2017) and the fast development of the mobile networks provided an opportunity for expanding DFS.^{lxxxix} In doing so, Guinea caught up with other African countries, where mobile banking has been long established to settle everyday payments. Mobile money and Fintecs have already demonstrated their ability to offer inclusive financial services by reaching out to a large part of the population. The increasing access to, and lower cost of, ICT will have a significant impact on adoption. Near-term opportunities in DFS include working through microfinance institutions, with mines (e.g., salary payments), or with government (e.g., tax, customs payments).^{lxxxii} These alternative financial structures need to be strengthened in order to potentially meet the investment and financial needs of the manufacturing sector. However, in order to use the advantages that come with modern telecommunication, its effectiveness and coverage needs to be strengthened. As the UNIDO Guinea Firm levelSurvey 2021 shows, 61% of the consulted companies classify the lack of telecommunication as a very severe obstacle. The results identify the lack of modern telecommunication technology and the low efficiency as the key challenges to overcome.

This potential of Fintecs applies in particular to SMEs, for which it is of particular difficulty to access loans. Loans granted to SMEs by commercial banks have declined from almost 5% of GDP in 2015 to less than 3% in 2019. Apart from missing investments, the lacking access to formal banks has also other far-reaching implications for the business operation

of SMEs. For instance, the lack of bank guarantees excludes local SMEs from public procurement opportunities, while the lack of working capital discourages local businesses from leveraging opportunities offered by multinationals largely in the mining sector, whose payment terms are generally long.^{lxxxiii}

Given the high interest rates and difficulties to access finance from commercial banks, SMEs and agriculture related enterprises have increasingly turned to microfinance. Microfinance institutions (MFI) have been growing rapidly with a net increase of deposits and loans. However, this growth is from a low base, and the total size of the microfinance sector is still only around US\$45 million (2017).^{lxxxiv} However, the Guinean microfinance sector is affected by poor governance, in particular in rural areas. Many institutions lack adequate reporting systems, show a weak performance and require well-coordinated efforts by the authorities and the MFIs to unfold their potential. Guinea's current microfinance sector, including the Crédit Rural de Guinée (CRG) do not seem to be financially sustainable. CRG's financial statements indicate that about 80 percent of its balance sheet is on suspense accounts, and only 10 percent of its assets are income generating.^{lxxxv} In fact, the capital base of many MFIs has been continuously eroded. The reported solvency ratio for the microfinance industry decreased from 11 percent in 2013 to 2 percent in 2015. These losses resulted mainly from loan delinquency and inadequate cost management.^{lxxxvi}

The government is fully aware of inadequacy of SME/SMI financing mechanisms and the unsuitability of the banking system to finance medium- and long-term industrial investments.^{lxxxvii} Among others, the government has established the Crédit Rural de Guinée (CRG) as a MFI to finance SMEs in particular in the rural area. The consultations confirmed the above-stated assessment by the World Bank highlighting that beneficiaries mistook the loans for state donations, which ultimately led to the high default rate. Furthermore, the microfinance structures have been vulnerable to corruption, which in addition undermined their performance. As an alternative, in 2019, the government has created the Industrial and SME Development Fund (FODIP). This fund will facilitate access to financing for SMEs at preferential rates.

The crucial question, however, is how to cope with informality as the key structural constraint of the private sector to grow and access finance. How to create the right incentives and support for the formalization of SMEs in the long term? And how to grant informal companies access to finance short term? One solution that has been highlighted in the consultations are those state programs that support certain informal by creating a cluster of firms that is provided with funding. Through these programs, fish smokers, a mainly informal sector, could benefit from state funding to expand their activities.

3.5 Bottlenecks in infrastructure

Infrastructure is not seen as part of the immediate inputs required in the production process. However, infrastructure is not less important as it is the basic facilities which directly benefit the process of production and distribution in an economy. Roads, railways, telecommunication systems, waterways, airways, electricity, energy and water supply,

waste management and others are examples of economic infrastructure. Social infrastructure as the second type of infrastructure includes schools, housing, hospitals and others facilities.

Infrastructure advancement is viewed as a fundamental factor that fosters economic development as telecommunication, transportation and energy are used in the production processes of every household and enterprise. Quality infrastructure contributes to raise productivity and lower costs in the productive activities of the economy. Therefore, infrastructure development is one of the most integral parts of the public policies in developing countries.

In the following section, the two identified bottlenecks transportation and electricity in the realm of infrastructure will be discussed in depth. 44% of surveyed firms in the ES 2016 named transportation and electricity a major or very severe obstacle for their business activities.

3.5.1 Transportation

Improvement in transportation is required to connect markets and boost factor mobility in order to increase the economic performance of a country. Sound transportation investments lower the costs of moving people and goods and, in doing so, increase economic productivity.

The bottleneck in the area of transportation impeding the growth of Guinean manufacturing is twofold. First, domestic transportation costs are in general considered too high. This increases production cost with negative effects on productivity and the competitiveness of Guinean products. Second, the existing flawed transportation structure fosters regional economic disparities and prevents the productive connection of supply and demand.

The infrastructure is mainly based on roads. Rail corridors within and through Guinea are very few and almost entirely dedicated to mineral transport. Guinea's road network is underdeveloped and in bad condition. At 2.9 km per 100 km², Guinea's national road density is very low benchmarked against its regional peers (5.1 km in Côte d'Ivoire, 6.2 km in Ghana, and 6.8 km in SSA on average). Less than one-third of national roads are paved, condition of which have been deteriorating over time. In 2004, only 35 percent of Guinea's national paved roads were in good condition. This share declined to 25 percent in 2012, and to just 16 % in 2014.^{lxxxviii}

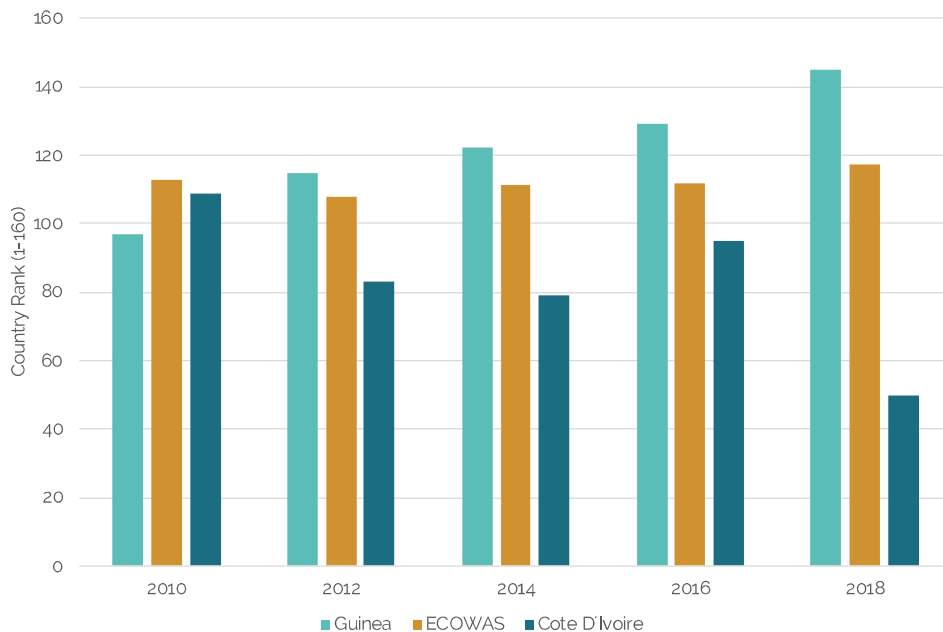
The port of Conakry (GNCKY) is the centerpiece of Guinea's infrastructure accounting for 45 percent of total fiscal revenues, 98 percent of customs revenues, and more than 10,000 jobs.^{lxxxix} The port is in a relative good condition, but has shown considerable management weaknesses. Another major issue occurs from the port congestion and the port's location in the city. Combined with undersize and poor condition road access, this causes major traffic jams and delays as trucks must wait until they can transit through Conakry during night hours.^{xc}As a result of these flaws the port of Conakry has become the most

expensive one among West-African ports for all types of vessels.^{xcii} The neighbouring ports in Abidjan, Dakar, and Nouakchott offer their services at significantly lower prices.

Given the challenges in productive infrastructure, the World Bank has raised concerns about the sufficiency of governmental spending levels and the public capacity to implement infrastructure projects. With around 10 percent of GDP, Guinea's infrastructure expenditures have been low over the years.^{xciii}

The low level of infrastructure investment, which led to significantly higher costs of transportation is also reflected in international rankings. Figure 3.13 illustrates the rankings in the Logistics Performance Index^{xciii} for Guinea and the ECOWAS average. The LPI measures the effectiveness of logistics across ports, railroads and roads. The higher the score and the corresponding ranking of a country, the weaker the logistics performance. Guinea's rank worsened by 48 points from 2010 to 2018, with a rank number 97 to 145 out of 160 countries in 2018. It also indicates the poorest performance compared to ECOWAS average and Cote D'Ivoire, whose logistics performance have improved considerably, from rank 109 in 2010 to rank 50 in 2018.

Figure 3.13. Guinea's LPI Rank (1 Best performance)

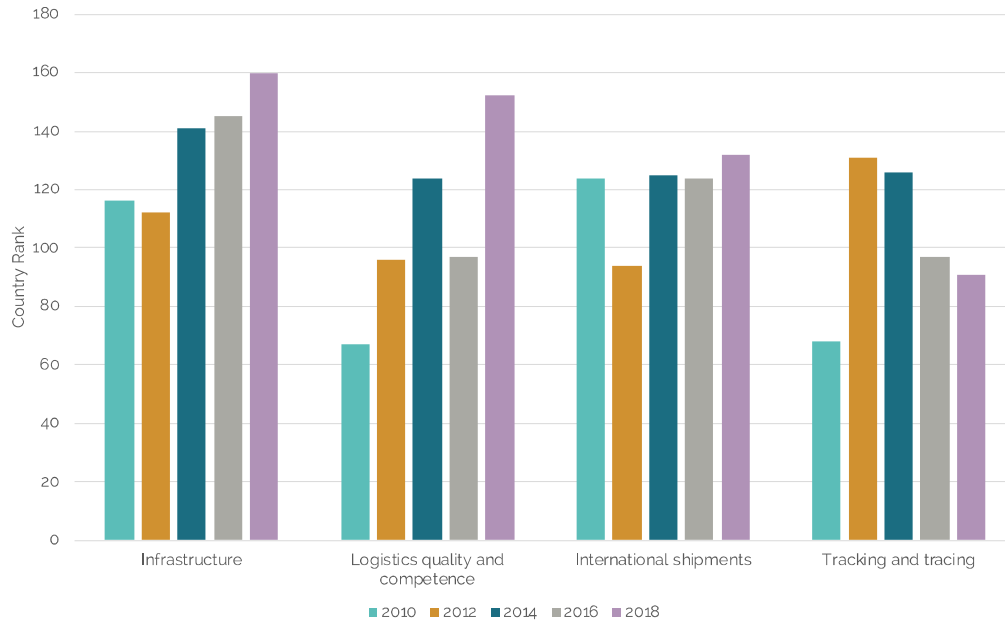


Source: Logistics Performance Index

Figure 3.14 shows that infrastructure is by far the most problematic factor and it has deteriorated in the last couple of years, from the rank 116 to 160. Likewise, the quality of logistics has declined from 67/160 to 152/160. However, tracking and tracing performance has managed to improve, as its ranking went from 131 in 2012 to 91 in 2018. Consultations pointed out the need of credits for the manufacturing sector, similar to the credits received by the mining sector to renew vehicle fleet. It is said that this will make

possible to control and improve the logistics of the country as many companies do not serve the market with its products due to lack of transport.

Figure 3.14. Logistic Ranking (1 Best performance)



Source: Logistics Performance Index

Apart from cost effects, the low quality of infrastructure development strengthens existing regional disparities and prevents the creation of productive linkages between the regions and the capital. The poor infrastructural development in the rural areas leads to a concentration of economic activities in the capital region. The majority of large companies, ministries and state agencies as well as International Organizations are located in and around Conakry. Consultations confirmed that also industrial companies prefer to operate in the Conakry area because of the quality of infrastructure and security. Given the relatively small size of the city, the government plans to expand it and develop the Grand Conakry region. However, due to the city's unplanned growth and limited space, the government encounters difficulties in reclaiming public spaces needed for urban and industrial development. Concentration of industrial activities due to poor infrastructure

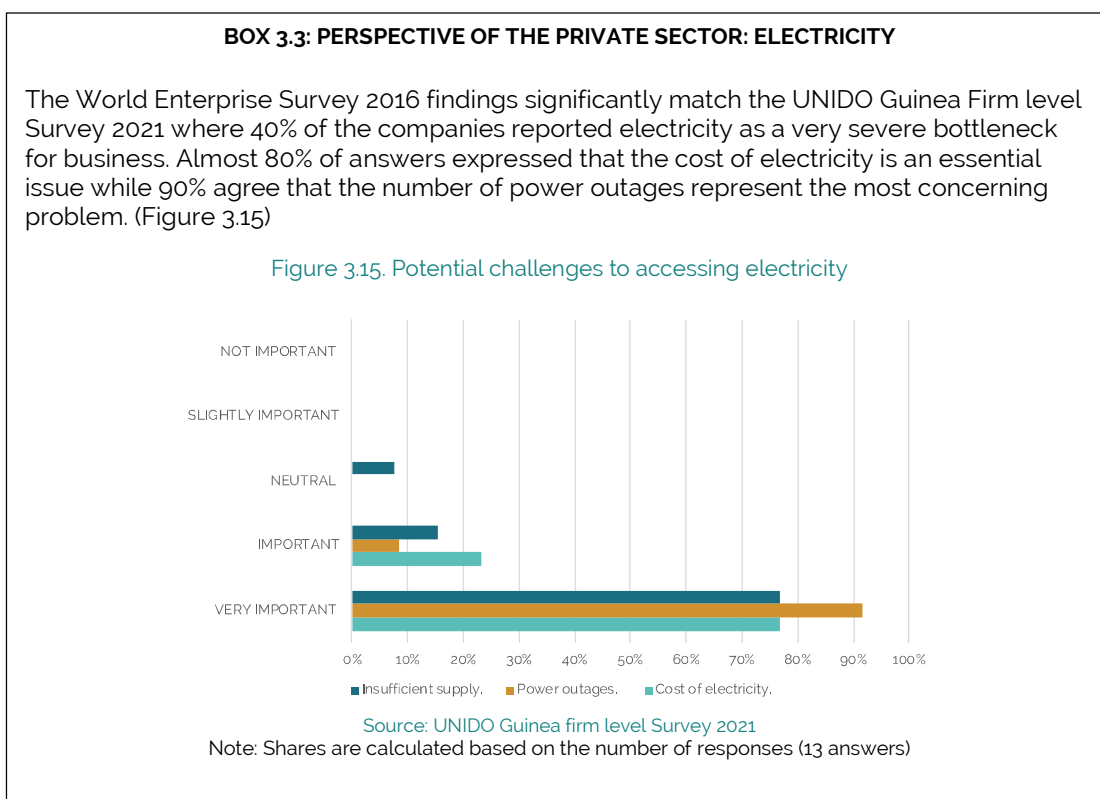
The country aims at developing manufacturing and, in particular agro-industries due to its potential to create positive linkages to the economy. The lack of sufficient logistics and infrastructure heavily affect the sector development due to the need to connect the material inputs from rural areas to urban areas, where most of the manufacturing sector is located.^{xciiv} The 2012 National Survey on Food Security and Vulnerability revealed that 57% of the villages in the rural areas are hardly accessible for at least a portion of the year, mainly due to rainfall (41 %) and deteriorating roads (30 %).^{xciiv} This situation negatively affects the access of farmers from communities to local markets therefore is problematic for the integration of agri-industries to national and international value chains.

The consultations highlighted that the government is making substantial efforts to overcome shortcomings in road infrastructure. A lot of road infrastructure is under construction. In the medium term, some railways are planned to be built. The fluidity on the roads could also be improved in the city, which helped to control the costs of transport and therefore the costs of production. However, these efforts relate only to urban areas, with rural areas seriously lacking in infrastructure. Consultations with the private sector also pointed out the need to build roads linking agricultural areas to industrial areas and consumers. This is particularly important for the government's vision to develop agro-processing zones around the country. Over 30% of the companies consulted through the UNIDO Guinea's Firm-level Survey 2021 confirmed that transport is a major issue for their businesses, however, 56% of the answers make reference to the lack of means of transportation as the key challenge.

3.5.2 Electricity

Without energy and reliable grids, capacity expansion (not only for the manufacturing sector) is hardly achievable. The main reason is that electricity is a crucial input for almost all production processes. Hence, a reliable power supply and power grids are an essential feature for an industrial upgrade especially in African countries.^{xvii}

The World Bank Enterprise Survey reported that electricity supply has been seen for 44% of surveyed manufacturing companies as a very severe or major obstacle. This is relatively low compared to 60% for the ECOWAS region. Despite Guinea's great potential for domestic power production, the country lacks a reliable power supply. However, the main bottleneck for manufacturing development are the costs of electricity and access to power in rural areas.



The World Bank enterprise survey 2016 reported (table 3.5) that the 74% of the manufacturing sector has have been affected by power outages in the last fiscal year, which is very close to the ECOWAS average. However, Guinea is performing significantly better compared to the region in the number and length of power outages. While in average manufacturing firms in the ECOWAS region experience 34,6 power outages with a length of 12,5h per month, manufactures in Guinea report only 10,2 outages with a length of 2,8h in average.

This suggests a more stable and reliable power supply in Guinea. Please note that this result can also be due to the small sample of companies located in the capital, where infrastructure and power supply is of better quality. The Ease of Doing Business Index 2019 ranks Guinea very low (and lower than the SSA region) with respect to reliability of supply (table 3.6). As electricity is needed for all manufacturing production processes, the question of reliability is crucial for companies.

Table 3.5. Bottleneck Electricity

	Guinea		ECOWAS	
	Manufacturing	Non-Manufacturing	Manufacturing	Non-Manufacturing
Experience power outages (%)	74,1%	83,7%	78,8%	80,9%
Number of power outages	10,2	9	34,6	31,9
Length of power outages (hours)	2,8	2,3	12,5	9,1
Own or shared generator	85,2%	64,2%	67,7%	59,4%
Shared electricity	33%	20,6%	46,9%	43,8%

Source: World Bank Enterprise Survey 2016

As discussed in chapter 1, in 2018 less than half of the population had access to electricity with a wide disparity of electrification between rural (7%) and urban areas (82%). In the 2019 Global Competitiveness index, Guinea's rank for Electricity Access was one of the lowest in the world, with 137/144. Lacking access to electricity presents a major obstacle to the (regional) diversification of the economy. Besides the large demand of electricity for processing bauxite into aluminum (see chapter 1 for details), in particular the growth of agri-business will be dependent on the availability of power. The consultations confirmed that the lack of electricity in rural areas and the high costs affect the value addition in manufacturing subsectors such as the coffee industry as roasting beans requires significant energy.

For opening and starting a business, it can be of equal importance to get electricity in an easy and timely manner. The Ease of Doing Business sub-components report that the process to access electricity in Guinea takes 4 procedures, while in Togo only 3. The SSA average is 5,2 procedures. In Guinea, business must invest 69 days to access electricity permits while in Togo 66 and SSA 109,6 days.^{xcvii} Benchmarked against the region, Guinea is relatively quick with providing access to electricity.

Table 3.6. Ease of Doing Business Getting electricity sub-components

Getting Electricity			
	Guinea	SSA	Togo
Procedures (number)	4	5,2	3
Time (days)	69	109,6	66
Cost (% of income per capita)	3232,2	3187,5	2120,4
Reliability of supply and transparency of tariff index (0-8)	0	1,6	3

Source: Ease of Doing Business 2019 (World Bank)

Finally, costs of electricity are higher in Guinea than in the SSA region and compared to Togo almost 50% more expensive (table 3.6). The consultations confirmed that cost of electricity is significantly high, in particular for energy intense productions.

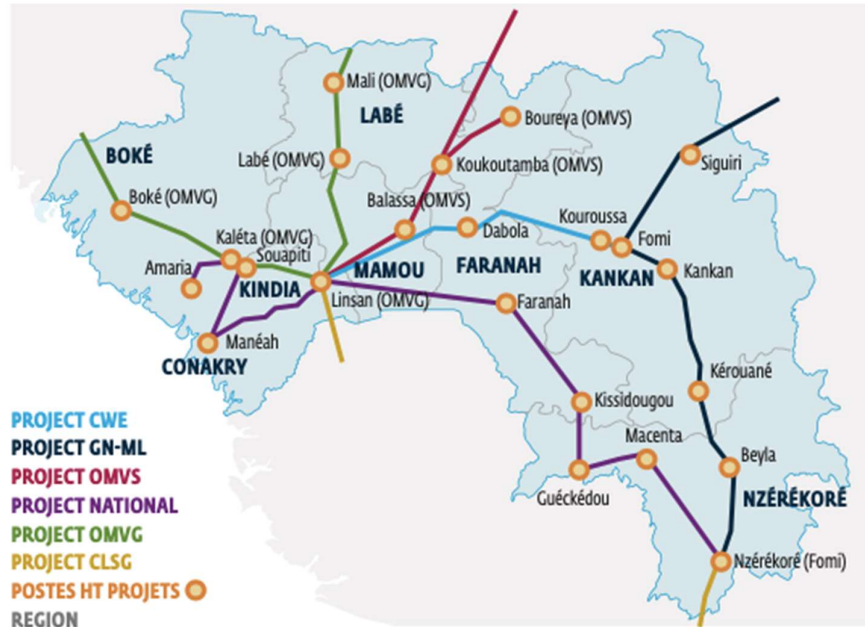
Electricity of Guinea (EDG) is the national utility company which provides the majority of electricity.^{xcviii} Power production by EDG is based on thermal and hydro-power stations. Large hydropower projects are under construction as the country enjoys huge water reserves. These large energy infrastructure projects have the potential to reduce the cost of energy generation by 30% compared to current costs.^{xcix}

EDG has been criticized for its poor performance and structural deficit. The weak billing system and revenue collection of about 70 percent prevent the EDG from covering its operating costs, thereby requiring significant subsidies from the Government (at about 1 percent of GDP).^c Guinea is paying for significantly more expensive thermal power at three times the cost of hydropower. Given the potential to become a significant low-cost hydro exporter to the region, the country has not yet been able to tap into its significant hydropower potential.^{ci}

There are various constraints to the effectiveness of EDG. First, lacking professional capacities cause a poor management of resources. Many projects have been a result of negotiations as opposed to structured competitive bidding processes and, hence, face increased financial, social and environmental risks.^{cii} A private management company has been contracted to support the EDG management and to revamp the utility.^{ciii} Second, a lack of a supportive policy, as well as of specific institutional, legal, and regulatory frameworks has been identified.^{civ} Third, financing issues hinder the power sector development, which requires sizable investment in power stations as well as to improve electricity access. EDG's management and governance issues constitute a fiscal drain and structural barrier to private sector growth. Recognizing this challenge, the government has established a reform process.^{cv}

The PNDES 2016 –2020 made the rehabilitation of the production and distribution apparatus of the electricity sector a priority. This includes, first and foremost, mobilizing resources for increasing Guinea’s hydroelectric potential and the promotion of solutions involving local communities and the private sector at rural level.

Figure 3.16. Map of Planned Regional Interconnections



Source: IFC Report 2020

According to IFC, the current and committed new power generation should exceed the evolving domestic demand from mining and other sectors. The regional inter-connections under development will provide the potential for Guinea to become a regional energy exporter.^{cvi}

3.6 Bottlenecks in governance

The role of government and the quality of governance in the process of economic and, in particular, industrial development is crucial. The history of industrial development has taught that successful industrialization always involved an active participation of the state. Governments provide incentives for entrepreneurship, invest in infrastructure, offer financial inducements and subsidies and many other targeted interventions in order to achieve a desired economic development and transformation.

Liberal economists have developed the framework of „Good governance“ as market-enhancing governance, which focuses on reducing transaction costs and enabling markets to work more efficiently. The World Bank Enterprise Survey and the Ease of Doing Business Index are good examples for that approach by looking at features such as corruption, business licenses and permits, tax rate and others. In contrast, heterodox

economists have stressed the role of industrial policy and growth-enhancing institutions, which focus on acquiring productivity-enhancing technologies and maintaining political stability in contexts of rapid social transformation.^{cvii} The two approaches to governance are not mutually exclusive and can be valuable for analyzing bottlenecks in governance.

The World Bank Enterprise survey has identified three bottlenecks that belong to the realm of governance (tax administration, corruption, political instability) that all have the potential to undermine the effectiveness and efficiency of governmental policies. The fourth bottleneck (lack of an industrial policy) has been identified on the basis of the desk research and the consultation process and refers to the absence of strategic focus of governmental interventions for developing the manufacturing sector.

3.6.1 Lack of a clear industrial policy

Based on the collection of information through the consultation process, stakeholders believe that the manufacturing sector plays a crucial role in the economic development of Guinea. The development of the manufacturing sector has the potential to contribute to the transformation and modernization of the economy and boost the creation of jobs for young people. The industrial sector can also have positive linkages to promote the agriculture and mining sector in order to add value to the rich natural resources.

The fact that there is a lack of strategic orientation in terms of industrialization in the country is accepted by stakeholders as to date, Guinea does not have a comprehensive Industrial Policy Strategy. Consultations clearly revealed the urgent need for policy capacity building, as the lack of policy design skills remains the main challenge (see section 3.1.4). The consultations also pointed out the lack an institutionalized exchange between the private sector and the government as the basis for designing appropriate interventions. It is important to rebuild the trust and collaboration of companies with the government as only 15 percent of companies believe that government and companies collaborate effectively and 19 percent of businesses believe the private sector trusts the government.^{cviii} Through an inclusive Industrial Policy, Guinea could form an effective coalition between the private sector and government in order to enhance its productive capacities, develop skilled human capital and position itself more strategically in the regional market integration initiatives.

In order for the industrial policy process to be effective, it must be evidence-based, participatory and focused on realistic objectives. Stakeholders expressed that the legitimacy of industrial policies is a critical factor, as all sectors must be involved and considered in its development. The legitimacy of industrial policy is based on the fact that no one should be left out of the process. This policy must respond to the need of all for industrial development in Guinea. International examples of good practice suggest that a successful industrial policy cycle should start with an in-depth industrial diagnosis that maps the local and global industrial landscape and provides an in-depth understanding of country characteristics, constraints and opportunities as well as global trends. National practitioners should be in the lead during the development of the country's Industrial Policy. Through technical capacity building and effective coordination among ministries,

Guinea can ensure a sustainable path towards the industrial transformation envisioned in Guinea Vision 2040.

3.6.2 Tax administration

41% of surveyed Guinean manufactures compared to 25% in the ECOWAS region name tax administration as a major or very severe obstacle. Also in another survey from 2020 is taxation among the top 5 factors hindering Guinea’s industrial sector development.^{cx} An effective tax administration is crucial for revenue collection as the fiscal basis of the state. As the tax administration is that part of the state bureaucracy companies have to deal with the most, business is very sensitive to its operation. If tax collection and dispute settlement are inefficient and overly bureaucratic, firms need to allocate more resources and time to pay taxes with a negative effect on the company’s efficiency.

Guinea is ranked 183 out of 190 economies in the Paying Taxes Indicator of the Doing Business Index. It is the country’s lowest performance in the overall index. The IFC report identified main constraints for the private sector with respect to taxes: high tax rates, lack of transparency of tax payment systems, cumbersome procedures, the absence of a VAT refund mechanism, and excessive and arbitrary controls and audits.^{cx}

Table 3.7. Ease of Doing Business: Paying Taxes

Paying Taxes			
	Guinea	SSA	Togo
Payments (number per year)	33	36.6	49
Time (hours per year)	400	280.6	159
Total Tax and contribution rate (% of profit)	69.3	47.3	48.2

Source: Ease of Doing Business 2019 (World Bank)

Table 3.7 summarizes the "Paying Taxes" sub- indicators of the Ease of Doing Business index for Guinea, SSA and Togo. Interestingly, Guinea's payments per year are the lowest (33) compared to SSA (36,6) and Togo (49) meaning it records the best performance under this topic. However, it requires almost double of the time (400 hours per year) that are spent for paying taxes than in Togo (159) and significantly more time than for the SSA average (280,6). Last, and significantly important for business is the tax rate as a share of profit. In Guinea an average business must contribute 69,3% of profits to taxes while SSA average is 47,3% and in Togo 48,2%. This finding is very much in line with the most recent survey on obstacles to private business in general, which revealed tax rate as one of the most significant impediments to private sector growth in Guinea.^{cxix} Similarly, 30% of companies consulted through the UNIDO Guinea Firm-level Survey 2021 expressed that high tax rates are a very severe issue. In some cases, companies reported tax payment difficulties.

Consultations reported that the administrative burden in the tax system (i) prevents the establishment and formalization of industrial companies and (ii) leads to the fact that larger registered firms account for the vast majority of tax payments. The taxation burden on small and medium enterprises are not perceptible or do not represent a priority to the government. Simplifying tax procedures for SMEs may, hence, broaden the tax base.

The government has made efforts in the past for the adoption of a taxation system specific to the informal sector, with a lump sum tax collected and managed by tax administrations at the sub-provincial or municipal level. The introduction of a single form based on self-declaration for economic actors liable to the Unified Business Tax has been also a step forward the simplification of procedures. However, this system is still inconvenient for illiterate taxpayers.^{cxix} The government has initiated various reforms to improve tax administration, including: the payment of taxes, duties, and fees due to the State by real-time bank transfers through the real-time gross settlement system (RTGS) or the creation of permanent tax identification numbers.^{cxix} However, the management of tax administration and collection remains inefficient mainly due to the lack of physical and human resources. Likewise, the low remuneration levels within the public system encourage corrupt practices in the treatment of administrative issues.^{cxix} The consultations confirmed that administrative procedures can always be improved, however, strengthening the skills of the civil servants that implement the procedures is now key to increase the efficiency of the tax administration. The UNIDO Guinea Firm-level Survey 2021 found that 30% of the consulted companies agreed that tax administration is a very important issue because of an unclear tax payment system. This affects manufacturing companies that depend on external markets, whether for imports or export. Closely related to this, 40% of the companies reported customs as a very severe bottleneck due to the time required clearance.

In addition, the consultations revealed that the state has recently implemented an electronic tax to allow businesses to pay taxes online. Beside realizing efficiency gains, this system allows to reduce physical contact with tax inspectors in order to minimize corruption.

3.6.3 Corruption

From a macro-economic perspective, high levels of corruption are bad because they damage growth and development. Corruption leads to allocative inefficiency, to diverting public resources for private gain and inhibit direct foreign investment into an economy. From a micro-economic perspective, corruption acts as an inefficient tax on business, ultimately raising production costs and reducing the profitability.

According to the Enterprise Survey (table 3.2), 52% of manufacturing firms named Corruption as major bottleneck to business in Guinea, which is above the average of 38% for the overall ECOWAS region. According to a recent survey, corruption has been ranked as one of the top five factors hindering Guinea's industrial sector development and is faced by firms irrespective of their size.^{cxv} This is confirmed by the UNIDO Guinea Firm-level Survey 2021. Almost 40% of the consulted companies classified corruptions as a very severe bottleneck. Corruption is in particular related to cross-border transactions as well as issues related to market access. Corruption within the state administration has been also identified as one of the main obstacles to the formalization of unregistered companies.^{cxvi}

According to the Transparency International – Corruption Perception Index 2016, Guinea ranks 142 out of 176 countries. With respect to "control of corruption" in the Worldwide Governance Indicators (WGI), Guinea performed worst compared to the average ECOWAS and SSA country. There has been an improvement between 2007 and 2018, however, Guinea remains way below the regional averages.^{cxvii}

According to round 7 (2016/2018) of the Afrobarometer perception survey, 49% of respondents said that the level of corruption has increased a lot in the last year. Especially towards state officials there is a widespread distrust of the population. 21% of respondents think that all state officials are involved in corruption and 30% think that most of state official are involved in corruption.^{cxviii}

Detailed data that could help us to understand how different branches of government and state agencies cope with corruption and which type of companies are more affected by corruption is unfortunately missing. There is only anecdotal evidence that the public procurement system has been very inefficient and endemically corrupt. According to the World Bank the costly and inefficient single sourcing of the procurement system was vulnerable to corruption and frequently bypassing existing rules, in particular in the context of the mining sector. In recent years, the Government has adopted a series of measures aimed at ensuring the adoption of international standards.^{cxix}

3.6.4 Political instability

A stable political environment and predictability is a prerequisite for a steady economic growth path. In general, uncertainty from political power changes, from altering policy directions or from a weak institutional framework is a major obstacle for growth as business and investment decisions may be postponed, reconsidered or simply not taken. In the best case, this will result in an economic stagnation but most often into a decline of the economic activity. Domestic investors might search for stable investment options in other countries and foreign investors will not enter the domestic market due to high potential business risks.

According to the World Bank Enterprise Survey, 59% of manufacturing firms reported Political instability as severe or major obstacle compared to only 31% in the ECOWAS Region. The Enterprise Survey was conducted in 2016 and gives, hence, a snapshot of a moment when tensions between the government and opposition were high. The consultations confirmed the existence of regular protests against the government, however, they don't lead to political instability. The consultations also highlighted the negative effects of these political protests for companies, which during these events due to security reasons have to stop their operation leading to the disruption of supply chains. Moreover, stakeholders have been aware of the negative signals to potential investors that are needed for the development of the manufacturing sector. Similarly, disclosed by the UNIDO Guinea Firm-level Survey 2021, companies believe that the main concerns related social-political situation is the economic uncertainty and insecurity. Insecurity is particularly perceive as an issue by 30% of the companies as it affects the attraction of FDI and creates uncertainty for the business plan.

With respect to policy stability, which means the credible commitment of the government to stick to general policy decisions and directions, the situation in the country looks significantly better. Guinea is ranked 128th/141 in the World Economic Forum's Competitiveness Report 2018 with respect to the general quality of institutions, which is a very low rating. In the sub-indicator Government ensuring policy stability, Guinea is ranked 105th/141, which indicates a higher reliability and, thus, predictability of public policies.

3.7 Summary of section 3 and implications for the industrial policy project

This section was dedicated to identifying and discussing the key bottlenecks for the development of the manufacturing sector in Guinea. Bottlenecks are obstacles that immediately prevent enterprises from unfolding their full growth potential. Bottlenecks are also impediments that may prevent to exploit the future growth and transformation potential that a country or sector has. The identification of major bottlenecks is hence of crucial importance for the design of effective state interventions, policies and projects in cooperation with development partners.

The assessment identified eight major bottlenecks for the development of the manufacturing sector in the three thematic areas of governance, factors of production and infrastructure.

In the realm of factors of production, two bottlenecks could be identified: informality and access to finance.

(i) Informality is the most dominant characteristic of the manufacturing sector in Guinea causing unfair competition with formal competitors. Beyond that immediate negative effect, informality has multiple implications for development such as impeding access to finance and modernization or limiting the tax base of the state. Informality is an economic survival strategy but prevents companies from becoming efficient and competitive by lowering factor costs. Any economic or industrial policy is highly recommended to incorporate the informal sector and making targeted and attractive offers in order to overcome the vicious circle informal entrepreneurs are caught in.

(ii) Access to finance is the prerequisite for any kind of expanding or upgrading economic activities. Access to finance is a bottleneck, first, due to the underdeveloped financial sector, which offers no industry-specific products at attractive prices. Second, the majority of companies due to their informal nature have no direct access to bank products. Two promising approaches could be identified that might be helpful to overcome this bottleneck. First, state programs that give funding not directly to informal companies but to clusters several informal establishments belong to. Second, Digital financial services have grown rapidly and demonstrated their ability to offer inclusive financial services by reaching out to a large part of the population. Strengthening these new structure might be helpful to potentially meet also the investment and financial needs of the manufacturing sector in the future.

In the area of infrastructure transportation and access to electricity have been identified as major bottlenecks.

(iii) The bottleneck in transportation is twofold: Transportation, in particular import and export, is very expensive and the country lacks reliable connectivity between the regions and the capital. This decreases competitiveness of Guinean products and hampers the development of the food-processing industry, which relies on connectivity with rural

areas. At the moment, government develops mainly the capital region. Future policy interventions might focus more on developing basic secondary industries in the regions. The consultations repeatedly highlighted the need of industrial zone as land dedicated exclusively to manufacturing establishments. The creation of industrial zone in the regions that enjoy good connectivity, electricity supply and favorable administrative procedures might be an approach not to attract FDI but to create regional "pockets of efficiency" for domestic producers.

(iv) The bottleneck in electricity consists of high prices, a very poor penetration of the country outside urban areas and, partly, in the reliability of electricity supply. The government has already taken measures to potentially lower electricity prices in the future due to cheaper hydro-power generation. The electrification of rural areas is still lacking. Granting targeted access to electricity or the development of decentralized power generations to allow manufactures to settle in rural areas are potential approaches.

Four of the top 8 bottlenecks (lack of industrial policy, corruption, tax administration and political instability) belong to the realm of governance, which underlines the necessity to improve the effectiveness of state-business relations in Guinea.

(v) The lack of an industrial policy is a bottleneck because developing the manufacturing sector needs (i) strategic focus and (ii) a productive collaboration and connection between state interventions and private sector investments. Guinea does not have a comprehensive development strategy that has been developed in a regular exchange between the government and private business.

(vi) An effective tax administration is crucial for revenue collection as the fiscal basis of the state. As the tax administration is that part of the state bureaucracy companies have to deal with the most, business is very sensitive to its operation. Despite improvement in the procedure, tax collection is still inefficient and overly bureaucratic. Guinean firms allocate significantly more time to pay taxes with a negative effect on the company's efficiency. Improvements in the tax administration and in other relevant state agencies should be continued. According to the consultation, more efforts should be made in training civil servants.

(vii) From macro-economic perspective, corruption leads to allocative inefficiency, to diverting public resources for private gain and inhibit direct foreign investment into an economy. From a micro-economic perspective, corruption acts as an inefficient tax on business, ultimately raising production costs and reducing the profitability. Corruption is still widespread and endemic in Guinea. Any reforms that may strengthen transparency and merit-based allocation decision will have positive effects on efficiency of state administration and the socio-economic development

(viii) Political instability has been identified as major obstacle for growth as business and investment decisions may be postponed, reconsidered or simply not taken. The consultations confirmed the existence of regular protests against the government, however, they don't lead to political instability.

Any tailored policy measure that addresses these bottlenecks will contribute to developing the Guinean manufacturing sector and help to put the whole economy on a sustainable and inclusive growth trajectory.

A Appendix to Section 1

Manufactured exports performance analysis has been developed using the following list of manufactured products on the basis of SITC Revision 3 from the UN COMTRADE Database. Highlighted sectors in table are classified as MHT sectors.

SITC Revision 3 - Manufactured export classification based on UNIDO's Competitive Industrial Performance Index (CIP)	
Product Code	Product Name
001	Live animals except fish
011	Beef, fresh/chlld/frozn
012	Meat nes,fresh/chld/froz
016	Meat/offal preserved
017	Meat/offal presvd n.e.s
022	Milk pr exc butter/cheese
023	Butter and cheese
024	Cheese and curd
025	Eggs, albumin
034	Fish, live/frsh/chld/froz
035	Fish, dried/salted/smoked
036	Crustaceans molluscs etc
037	Fish/shellfish, prep/pres
041	Wheat/meslin
042	Rice
043	Barley grain
044	Maize except sweet corn.
045	Cereal grains nes
046	Flour/meal wheat/meslin
047	Cereal meal/flour n.e.s
048	Cereal etc flour/starch
054	Vegetables, frsh/chld/frz
056	Veg root/tuber prep/pres
057	Fruit/nuts, fresh/dried
058	Fruit presvd/fruit preps
059	Fruit/veg juices
061	Sugar/mollasses/honey
062	Sugar confectionery
071	Coffee/coffee substitute
072	Cocoa
073	Chocolate/cocoa preps
074	Tea and mate
075	Spices

081	Animal feed ex unml cer.
091	Margarine/shortening
098	Edible products n.e.s.
111	Beverage non-alcohol nes
112	Alcoholic beverages
121	Tobacco, raw and wastes
122	Tobacco, manufactured
211	Hide/skin (ex fur) raw
212	Furskins/pieces, raw
222	Oil seeds etc - soft oil
223	Oil seeds-not soft oil
231	Natural rubber/latex/etc
232	Rubber synth/waste/etc
244	Cork natural/raw/waste
245	Fuel wood/wood charcoal
246	Wood chips/waste
247	Wood in rough/squared
248	Wood simply worked
251	Pulp and waste paper
261	Silk
263	Cotton
264	Jute/bast fibre raw/retd
265	Veg text fibre ex cot/ju
266	Synthetic spinning fibre (MT)
267	Man-made fibres nes/wast (MT)
268	Wool/animal hair
269	Worn clothing etc
272	Fertilizers crude
273	Stone/sand/gravel
274	Sulphur/unroastd pyrites
277	Natural abrasives n.e.s.
278	Other crude minerals
281	Iron ore/concentrates
282	Ferrous waste/scrap
283	Copper ores/concentrates
284	Nickel ores/concs/etc
285	Aluminium ores/concs/etc
286	Uranium/thorium ore/conc
287	Base metal ore/conc nes
288	Nf base metal waste nes
289	Precious metal ore/conc.
291	Crude animal mterial nes
292	Crude veg materials nes
321	Coal non-agglomerated

322	Briquettes/lignite/peat
325	Coke/semi-coke/retort c
333	Petrol./bitum. oil,crude
334	Heavy petrol/bitum oils
335	Residual petrol. prods
342	Liquid propane/butane
343	Natural gas
344	Petrol./hydrocarbon gas
345	Coal gas/water gas/etc
351	Electric current
411	Animal oil/fat
421	Fixed veg oil/fat, soft
422	Fixed veg oils not soft
431	Animal/veg oils proces`d
511	Hydrocarbons/derivatives
512	Alcohols/phenols/derivs (MT)
513	Carboxylic acid compound (MT)
514	Nitrogen function compds
515	Organo-inorganic compnds
516	Other organic compounds
522	Elements/oxides/hal salt
523	Metal salts of inorg acid
524	Other inorganic chemical
525	Radio-active etc matrial (HT)
531	Synth org colour agents
532	Dyeing/tanning extracts
533	Pigments/paints/varnish (MT)
541	Pharmaceut exc medicamnt (HT)
542	Medicaments include vet (HT)
551	Essent.oil/perfume/flavr
553	Perfume/toilet/cosmetics (MT)
554	Soaps/cleansers/polishes (MT)
562	Manufactured fertilizers (MT)
571	Primary ethylene polymer (MT)
572	Styrene primary polymers (MT)
573	Vinyl chloride etc polym (MT)
574	Polyacetals/polyesters.. (MT)
575	Plastic nes-primary form (MT)
579	Plastic waste/scrap (MT)
581	Plastic tube/pipe/hose (MT)
582	Plastic sheets/film/etc (MT)
583	Monofilament rods/sticks (MT)
591	Household/garden chemical (MT)
592	Starches/glues/etc.

593	Explosives/pyrotechnics (MT)
597	Oil etc additives/fluids (MT)
598	Misc chemical prods nes (MT)
611	Leather
612	Leather manufactures
613	Furskins tanned/dressed
621	Materials of rubber
625	Rubber tyres/treads
629	Articles of rubber nes
633	Cork manufactures
634	Veneer/plywood/etc
635	Wood manufactures n.e.s.
641	Paper/paperboard
642	Cut paper/board/articles
651	Textile yarn
652	Cotton fabrics, woven
653	Man-made woven fabrics (MT)
654	Woven textile fabric nes
655	Knit/crochet fabrics
656	Tulle/lace/embr/trim etc
657	Special yarns/fabrics
658	Made-up textile articles
659	Floor coverings etc.
661	Lime/cement/constr mat ^l
662	Clay/refractory material
663	Mineral manufactures nes
664	Glass
665	Glassware
666	Pottery
667	Pearls/precious stones
671	Pig iron etc ferro alloy (MT)
672	Primary/prods iron/steel (MT)
673	Flat rolled iron/st prod
674	Rolled plated m-steel
675	Flat rolled alloy steel
676	Iron/steel bars/rods/etc
677	Iron/steel railway matl
678	Iron/steel wire (MT)
679	Iron/steel pipe/tube/etc
681	Silver/platinum etc
682	Copper
683	Nickel
684	Aluminium
685	Lead

686	Zinc
687	Tin
689	Misc non-ferr base metal
691	Iron/stl/alum structures
692	Metal store/transpt cont
693	Wire prod exc ins electr
694	Nails/screws/nuts/bolts
695	Hand/machine tools
696	Cutlery
697	Base metal h"hold equipms
699	Base metal manufac nes
711	Steam generating boilers (MT)
712	Steam/vapour turbines (MT)
713	Internal combust engines (MT)
714	Engines non-electric (MT)
716	Rotating electr plant (HT)
718	Power generating equ nes (HT)
721	Agric machine ex tractr (MT)
722	Tractors (MT)
723	Civil engineering plant(MT)
724	Textile/leather machinry (MT)
725	Paper industry machinery (MT)
726	Printing industry machny (MT)
727	Food processing machines (MT)
728	Special indust machn nes (MT)
731	Mach-tools remove mtrial (MT)
733	Mtl m-tools w/o mtl-rmvl (MT)
735	Metal machine tool parts (MT)
737	Metalworking machine nes (MT)
741	Indust heat/cool equipmt (MT)
742	Pumps for liquids (MT)
743	Fans/filters/gas pumps (MT)
744	Mechanical handling equipment (MT)
745	Non-electr machines nes (MT)
746	Ball/roller bearings (MT)
747	Taps/cocks/valves (MT)
748	Mech transmission equmnt (MT)
749	Non-elec parts/acc machn (MT)
751	Office machines (HT)
752	Computer equipment (HT)
759	Office equip parts/accs. (HT)
761	Television receivers (MT)
762	Radio broadcast receiver (MT)
763	Sound/tv recorders etc (MT)

764	Telecomms equipment nes (HT)
771	Elect power transm equip (HT)
772	Electric circuit equipment (MT)
773	Electrical distrib equipment (MT)
774	Medical etc el diag equi (HT)
775	Domestic equipment (MT)
776	Valves/transistors/etc (HT)
778	Electrical equipment nes (MT)
781	Passenger cars etc (MT)
782	Goods/service vehicles (MT)
783	Road motor vehicles nes (MT)
784	Motor veh parts/access (MT)
785	Motorcycles/cycles/etc (MT)
786	Trailers/caravans/etc (MT)
791	Railway vehicles/equipmt (MT)
792	Aircraft/spacecraft/etc (HT)
793	Ships/boats/etc (MT)
811	Prefabricated buildings (MT)
812	Sanitary/plumb/heat fixt (MT)
813	Lighting fixtures etc (MT)
821	Furniture/stuff furnishg
831	Trunks and cases
841	Mens/boys wear, woven
842	Women/girl clothing wven
843	Men/boy wear knit/croch
844	Women/girl wear knit/cro
845	Articles of apparel nes
846	Clothing accessories
848	Headgear/non-text clothg
851	Footwear
871	Optical instruments nes (HT)
872	Medical/etc instruments (MT)
873	Meters and counters nes (MT)
874	Measure/control app nes (HT)
881	Photographic equipment (HT)
882	Photographic supplies (MT)
883	Cine fild developed
884	Optical fibres (MT)
885	Watches and clocks (MT)
891	Arms and ammunition (HT)
892	Printed matter
893	Articles nes of plastics
894	Baby carr/toy/game/sport
895	Office/stationery supply

896	Art/collections/antiques
897	Jewellery
898	Musical instrums/records
899	Misc manuf articles nes
961	Coin nongold non current
971	Gold non-monetary ex ore

B Appendix to Section 2

B.1 Technical Appendix

B.1.1 Matching Trade Data to Manufacturing Sectors

The trade flows used in this analysis were obtained from UN-COMTRADE and follow the SITC Rev.3 and Rev.3 at 5-digit level, respectively. Correspondence between both SITC goods classifications and the manufacturing sector classification following the ISIC Revision 3 is established following UN-Stats¹⁸ and eurostat RAMON¹⁹ (Reference And Management Of Nomenclatures). Aggregating sector information from the 4-digit to the 2-digit level can then be performed by simply summing up all 4-digit industries that belong to a particular 2-sector industry or, alternatively, any alternative ISIC sector combination. The ISIC combination chosen for this report is presented in section B.1.2 and was defined with the objective of having a straight-forward correspondence between different data sources and classification standards in order to guarantee a consistent definition of manufacturing sectors throughout this report that can also be applied easily to different classification formats. A complete conversion table between the SITC Rev.3 and ISIC Rev.3 is provided in Table B.1. Throughout the report only trade in commodities is considered. Consequently, whenever talking about trade import/exports related to manufacturing industries we refer to traded commodities that can be attributed to a certain manufacturing sector.

Table B.1: Correspondence of SITC and ISIC Classification

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
0111	0451	1711	65265	2411	51486	2710	67317	2924	72343	3694	89427
0111	0452	1711	65291	2411	51489	2710	67319	2924	72344	3694	89429
0111	0453	1711	65292	2411	51541	2710	67321	2924	72345	3694	89431
0111	04591	1711	65293	2411	51542	2710	67322	2924	72346	3694	89433
0111	04592	1711	65294	2411	51543	2710	67323	2924	72347	3694	89435
0111	04593	1711	65295	2411	51544	2710	67324	2924	72348	3694	89437
0111	04599	1711	65296	2411	51549	2710	67325	2924	72392	3694	89439
0111	0541	1711	65297	2411	5155	2710	67326	2924	72393	3699	26901
0111	05421	1711	65298	2411	51561	2710	67327	2924	72399	3699	26902
0111	05422	1711	65311	2411	51562	2710	67329	2924	72831	3699	65912
0111	05423	1711	65312	2411	51569	2710	67331	2924	72832	3699	87452
0111	05424	1711	65313	2411	51573	2710	67332	2924	72833	3699	8941
0111	05425	1711	65314	2411	51574	2710	67333	2924	72834	3699	89445
0111	05429	1711	65315	2411	51575	2710	67334	2924	72839	3699	89449
0111	05481	1711	65316	2411	51577	2710	67335	2924	74472	3699	8946
0111	05483	1711	65317	2411	51579	2710	67336	2925	72138	3699	89521
0111	05484	1711	65318	2411	51612	2710	67337	2925	72139	3699	89522
0111	05487	1711	65319	2411	51613	2710	67338	2925	72191	3699	89523
0111	05488	1711	65321	2411	51614	2710	67339	2925	72198	3699	89592
0111	05489	1711	65325	2411	51615	2710	67341	2925	72711	3699	89593
0111	08111	1711	65329	2411	51616	2710	67342	2925	72719	3699	89594
0111	08112	1711	65331	2411	51617	2710	67343	2925	72721	3699	89721
0111	08113	1711	65332	2411	51621	2710	67344	2925	72722	3699	89729
0111	1211	1711	65333	2411	51622	2710	67345	2925	72729	3699	89911
0111	1212	1711	65334	2411	51623	2710	67346	2925	72843	3699	89919
0111	22211	1711	65341	2411	51624	2710	67347	2925	72853	3699	89921
0111	22212	1711	65342	2411	51625	2710	67348	2925	74137	3699	89929
0111	2222	1711	65343	2411	51626	2710	67349	2925	74184	3699	89931
0111	2223	1711	65351	2411	51627	2710	67351	2925	74187	3699	89932
0111	2224	1711	65352	2411	51628	2710	67352	2925	74351	3699	89933
0111	2225	1711	65359	2411	51629	2710	67353	2926	72433	3699	89934
0111	22261	1711	6536	2411	51631	2710	67411	2926	72435	3699	89935
0111	22262	1711	65381	2411	51639	2710	67412	2926	72439	3699	89936
0111	2227	1711	65382	2411	51691	2710	67413	2926	72441	3699	89937
0111	2231	1711	65383	2411	51699	2710	67414	2926	72442	3699	89939
0111	2232	1711	65389	2411	5221	2710	67421	2926	72443	3699	89941
0111	2234	1711	65391	2411	52221	2710	67422	2926	72449	3699	89942
0111	2235	1711	65393	2411	52222	2710	67431	2926	72451	3699	89949
0111	2237	1711	65411	2411	52223	2710	67432	2926	72452	3699	89972
0111	2311	1711	65413	2411	52224	2710	67441	2926	72453	3699	89981
0111	23121	1711	65419	2411	52225	2710	67442	2926	72454	3699	89982
0111	23125	1711	65421	2411	52226	2710	67443	2926	72455	3699	89983
0111	23129	1711	65422	2411	52227	2710	67444	2926	72461	3699	89984
0111	2631	1711	65431	2411	52228	2710	67451	2926	72467	3699	89985
0111	2641	1711	65432	2411	52229	2710	67452	2926	72468	3699	89986
0111	26511	1711	65433	2411	52231	2710	67511	2926	72471	3699	89987
0111	26521	1711	65434	2411	52232	2710	67512	2926	72472	3699	89988
0111	26541	1711	65435	2411	52234	2710	67521	2926	72473	3699	89989

¹⁸ See <https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp>.

¹⁹ See https://ec.europa.eu/eurostat/ramon/reasons/index.cfm?TargetUrl=LST_REL.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
0111	26551	1711	65441	2411	52235	2710	67522	2926	72474	3699	89991
0111	26571	1711	65442	2411	52236	2710	67531	2926	72481	3699	89992
0111	26581	1711	65445	2411	52237	2710	67532	2926	72483	3699	89994
0111	29241	1711	65446	2411	52238	2710	67533	2926	72485	3699	89995
0111	29242	1711	65492	2411	52239	2710	67534	2926	72488	3699	89997
0111	29249	1711	65493	2411	52241	2710	67535	2926	72491	4010	3510
0111	29251	1711	65494	2411	52242	2710	67536	2926	72492	4010	52517
0111	29252	1711	65495	2411	52251	2710	67537	2927	89111	4020	3450
0111	0411	1711	65496	2411	52252	2710	67538	2927	89112	7421	89282
0111	0412	1711	65497	2411	52253	2710	67541	2927	89114	7494	8825
0111	0421	1711	2613	2411	52254	2710	67542	2927	89121	7494	8826
0111	0430	1711	26149	2411	52255	2710	67543	2927	89122	9211	8831
0111	0441	1711	2634	2411	52256	2710	67551	2927	89123	9211	8839
0111	0449	1711	2649	2411	52257	2710	67552	2927	89124	9214	89611
0112	0544	1711	26512	2411	52262	2710	67553	2927	89129	9214	89612
0112	05451	1711	26513	2411	52263	2710	67554	2927	89131	9214	8962
0112	05452	1711	26529	2411	52264	2710	67555	2927	89139	9214	8963
0112	05453	1711	26549	2411	52265	2710	67556	2927	89191	9214	8964
0112	05454	1711	26559	2411	52266	2710	67561	2927	89193	9214	8965
0112	05455	1711	26579	2411	52268	2710	67562	2927	89195	9214	8966
0112	05456	1711	26589	2411	52269	2710	67571	2927	89199	9302	29191
0112	05457	1711	26671	2411	5231	2710	67572	2929	72511	.	.
0112	05458	1711	26672	2411	52322	2710	67573	2929	72512	.	.
0112	05459	1711	26673	2411	52329	2710	67574	2929	72521	.	.
0112	05791	1711	26679	2411	52331	2710	676	2929	72523	.	.
0112	29253	1711	26713	2411	52332	2710	6761	2929	72525	.	.
0112	29254	1711	26821	2411	52339	2710	67611	2929	72527	.	.
0112	29259	1711	26829	2411	52341	2710	67612	2929	72529	.	.
0112	29261	1711	26863	2411	52342	2710	67613	2929	72591	.	.
0112	29269	1711	26871	2411	52343	2710	67614	2929	72599	.	.
0112	29271	1711	26873	2411	52344	2710	67615	2929	72631	.	.
0113	05711	1711	26877	2411	52345	2710	67617	2929	72651	.	.
0113	05712	1711	41134	2411	52349	2710	67619	2929	72659	.	.
0113	05721	1711	41135	2411	52359	2710	6762	2929	72661	.	.
0113	05722	1711	65112	2411	52361	2710	67621	2929	72663	.	.
0113	05729	1711	65113	2411	52363	2710	67622	2929	72665	.	.
0113	0573	1711	65114	2411	52364	2710	67623	2929	72667	.	.
0113	0574	1711	65115	2411	52365	2710	67624	2929	72668	.	.
0113	05751	1711	65116	2411	52372	2710	67625	2929	72681	.	.
0113	05752	1711	65117	2411	52373	2710	67629	2929	72689	.	.
0113	0576	1711	65118	2411	52374	2710	67631	2929	72691	.	.
0113	05771	1711	65119	2411	52375	2710	67632	2929	72699	.	.
0113	05772	1711	65121	2411	52379	2710	67633	2929	72841	.	.
0113	05773	1711	65122	2411	52381	2710	67634	2929	72842	.	.
0113	05774	1711	65131	2411	52382	2710	67639	2929	72846	.	.
0113	05775	1711	65132	2411	52383	2710	67641	2929	72847	.	.
0113	05776	1711	65133	2411	52384	2710	67642	2929	72849	.	.
0113	05777	1711	65134	2411	52389	2710	67643	2929	72851	.	.
0113	05778	1711	65141	2411	52431	2710	67644	2929	72852	.	.
0113	05779	1711	65142	2411	52432	2710	67645	2929	72855	.	.
0113	05791	1711	65143	2411	52491	2710	67646	2929	74185	.	.
0113	05792	1711	65144	2411	52492	2710	67647	2929	74186	.	.
0113	05793	1711	65161	2411	52493	2710	67648	2929	74355	.	.
0113	05794	1711	65169	2411	52494	2710	67681	2929	74529	.	.
0113	05795	1711	65171	2411	52495	2710	67682	2929	74565	.	.
0113	05796	1711	65176	2411	52499	2710	67683	2929	74911	.	.
0113	05797	1711	65181	2411	52591	2710	67684	2929	74912	.	.
0113	05798	1711	65182	2411	52595	2710	67685	2929	74913	.	.
0113	05799	1711	65183	2411	53111	2710	67686	2929	74914	.	.
0113	07111	1711	65184	2411	53112	2710	67687	2929	74915	.	.
0113	0721	1711	65185	2411	53113	2710	67688	2929	74916	.	.
0113	07412	1711	65186	2411	53114	2710	67701	2929	74917	.	.
0113	07414	1711	65187	2411	53115	2710	67709	2929	74918	.	.
0113	07431	1711	65192	2411	53116	2710	6781	2929	74919	.	.
0113	07511	1711	65193	2411	53117	2710	67811	2930	69731	.	.
0113	07512	1711	65194	2411	53119	2710	67812	2930	69732	.	.
0113	07513	1711	65196	2411	53121	2710	67813	2930	69733	.	.
0113	07521	1721	65811	2411	53122	2710	67821	2930	69734	.	.
0113	07522	1721	65812	2411	53221	2710	67829	2930	74181	.	.
0113	07523	1721	65813	2411	53222	2710	67911	2930	74182	.	.
0113	07524	1721	65819	2411	53231	2710	67912	2930	74341	.	.
0113	07525	1721	65821	2411	53232	2710	67913	2930	74345	.	.
0113	07526	1721	65822	2411	53311	2710	67914	2930	77511	.	.
0113	07527	1721	65823	2411	53312	2710	67915	2930	77512	.	.
0113	07528	1721	65824	2411	53313	2710	67916	2930	77521	.	.
0113	07529	1721	65829	2411	53314	2710	67917	2930	77522	.	.
0121	00111	1721	65831	2411	53315	2710	67931	2930	7753	.	.
0121	00119	1721	65832	2411	53316	2710	67932	2930	77541	.	.
0121	00121	1721	65833	2411	53317	2710	67933	2930	77542	.	.
0121	00122	1721	65839	2411	53318	2710	67939	2930	77549	.	.
0121	00151	1721	65841	2411	59811	2710	67941	2930	77571	.	.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
0121	00152	1721	65842	2411	59813	2710	67942	2930	77572	.	.
0121	26811	1721	65843	2411	59814	2710	67943	2930	77573	.	.
0121	29194	1721	65844	2411	59818	2710	67944	2930	77579	.	.
0122	00131	1721	65845	2411	59865	2710	67949	2930	77581	.	.
0122	00139	1721	65846	2411	66741	2710	67951	2930	77582	.	.
0122	00141	1721	65847	2411	66742	2710	67952	2930	77583	.	.
0122	00149	1721	65848	2412	2721	2710	67953	2930	77584	.	.
0122	0019	1721	65851	2412	2722	2710	67954	2930	77585	.	.
0122	01292	1721	65852	2412	52233	2710	67955	2930	77586	.	.
0122	01293	1721	65859	2412	52261	2710	67956	2930	77587	.	.
0122	0251	1721	65891	2412	52321	2710	67959	2930	77588	.	.
0122	0616	1721	65892	2412	52351	2720	28321	2930	77589	.	.
0122	09892	1721	65893	2412	52352	2720	28322	2930	81215	.	.
0122	21199	1721	65899	2412	52362	2720	28421	2930	81217	.	.
0122	2121	1721	82127	2412	52371	2720	28422	2930	81219	.	.
0122	21221	1721	82129	2412	56211	2720	2852	3000	72655	.	.
0122	21222	1721	89996	2412	56212	2720	68112	3000	75113	.	.
0122	21223	1722	65921	2412	56213	2720	68113	3000	75115	.	.
0122	21224	1722	65929	2412	56214	2720	68114	3000	75116	.	.
0122	21225	1722	6593	2412	56215	2720	68122	3000	75118	.	.
0122	21226	1722	65941	2412	56216	2720	68123	3000	75119	.	.
0122	21229	1722	65942	2412	56217	2720	68124	3000	75121	.	.
0122	2123	1722	65943	2412	56219	2720	68125	3000	75122	.	.
0122	26141	1722	65949	2412	56221	2720	68211	3000	75123	.	.
0122	2683	1722	65951	2412	56222	2720	68212	3000	75124	.	.
0122	26851	1722	65952	2412	56229	2720	68213	3000	75128	.	.
0122	26859	1722	65959	2412	56231	2720	68214	3000	75131	.	.
0122	43142	1722	65961	2412	56232	2720	68231	3000	75132	.	.
0200	29299	1722	65969	2412	56239	2720	68232	3000	75133	.	.
0200	63491	1723	65751	2412	56291	2720	68241	3000	75134	.	.
0200	2313	1723	65752	2412	56292	2720	68242	3000	75135	.	.
0200	24403	1723	65759	2412	56293	2720	68251	3000	75191	.	.
0200	24501	1729	65191	2412	56294	2720	68252	3000	75192	.	.
0200	2474	1729	65491	2412	56295	2720	68261	3000	75193	.	.
0200	24751	1729	65611	2412	56296	2720	68262	3000	75199	.	.
0200	24752	1729	65612	2412	56299	2720	68271	3000	7521	.	.
0200	29221	1729	65613	2413	23211	2720	68272	3000	7522	.	.
0200	29222	1729	65614	2413	23212	2720	68311	3000	7523	.	.
0200	29229	1729	65621	2413	23213	2720	68312	3000	7526	.	.
0200	29231	1729	65629	2413	23214	2720	68321	3000	7527	.	.
0200	29232	1729	65631	2413	23215	2720	68322	3000	7529	.	.
0200	29239	1729	65632	2413	23216	2720	68323	3000	7591	.	.
0200	29272	1729	65641	2413	23217	2720	68324	3000	7599	.	.
0200	29292	1729	65642	2413	23218	2720	68411	3000	75991	.	.
0200	29293	1729	65643	2413	23219	2720	68412	3000	75993	.	.
0200	29294	1729	65651	2413	57111	2720	68421	3000	75997	.	.
0200	29295	1729	65659	2413	57112	2720	68422	3110	7161	.	.
0200	29296	1729	65711	2413	5712	2720	68423	3110	7162	.	.
0500	03411	1729	65712	2413	5719	2720	68424	3110	71631	.	.
0500	03412	1729	65719	2413	57211	2720	68425	3110	71632	.	.
0500	03413	1729	6572	2413	57219	2720	68426	3110	7164	.	.
0500	03414	1729	65731	2413	57291	2720	68427	3110	71651	.	.
0500	03415	1729	65732	2413	57292	2720	68511	3110	71652	.	.
0500	03416	1729	65733	2413	57299	2720	68512	3110	7169	.	.
0500	03417	1729	65734	2413	57311	2720	68521	3110	77111	.	.
0500	03418	1729	6574	2413	57312	2720	68522	3110	77119	.	.
0500	0362	1729	65771	2413	57313	2720	68524	3110	77121	.	.
0500	03631	1729	65772	2413	57391	2720	68611	3110	77123	.	.
0500	03633	1729	65773	2413	57392	2720	68612	3110	77125	.	.
0500	03635	1729	65781	2413	57393	2720	68631	3110	77129	.	.
0500	29115	1729	65785	2413	57394	2720	68632	3120	77241	.	.
0500	29197	1729	65789	2413	57399	2720	68633	3120	77242	.	.
0500	29297	1729	65791	2413	57411	2720	68634	3120	77243	.	.
0500	66711	1729	65792	2413	57419	2720	68711	3120	77244	.	.
0500	66712	1729	65793	2413	5742	2720	68712	3120	77245	.	.
1010	3211	1730	65511	2413	57431	2720	68721	3120	77249	.	.
1010	32121	1730	65512	2413	57432	2720	68722	3120	77251	.	.
1010	32122	1730	65519	2413	57433	2720	68723	3120	77252	.	.
1010	3221	1730	65521	2413	57434	2720	68724	3120	77253	.	.
1020	32221	1730	65522	2413	57439	2720	68911	3120	77254	.	.
1020	32222	1730	65523	2413	57511	2720	68912	3120	77255	.	.
1030	3223	1730	65529	2413	57512	2720	68913	3120	77257	.	.
1110	27896	1730	8453	2413	57513	2720	68914	3120	77258	.	.
1110	3330	1730	8454	2413	57519	2720	68915	3120	77259	.	.
1110	3431	1730	84621	2413	57521	2720	68981	3120	77261	.	.
1110	3432	1730	84622	2413	57529	2720	68982	3120	77262	.	.
1200	2861	1730	84629	2413	57531	2720	68983	3120	77281	.	.
1200	2862	1810	65761	2413	57539	2720	68984	3120	77282	.	.
1310	2815	1810	65762	2413	57541	2720	68991	3130	77311	.	.
1310	2816	1810	84111	2413	57542	2720	68992	3130	77312	.	.
1320	2831	1810	84112	2413	57543	2720	68993	3130	77314	.	.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
1320	2841	1810	84119	2413	57544	2720	68994	3190	77315	.	.
1320	2851	1810	84121	2413	57545	2720	68995	3190	77317	.	.
1320	2874	1810	84122	2413	57551	2720	68996	3190	77318	.	.
1320	2875	1810	84123	2413	57552	2720	68997	3140	77811	.	.
1320	2876	1810	8413	2413	57553	2720	68998	3140	77812	.	.
1320	2877	1810	8414	2413	57554	2720	68999	3140	77817	.	.
1320	28781	1810	84151	2413	57559	2720	69981	3140	77819	.	.
1320	28782	1810	84159	2413	57591	2720	69983	3150	77821	.	.
1320	28783	1810	84161	2413	57592	2720	69985	3150	77822	.	.
1320	28784	1810	84162	2413	57593	2720	69987	3150	77823	.	.
1320	28785	1810	84169	2413	57594	2720	69991	3150	77824	.	.
1320	28791	1810	84211	2413	57595	2720	69992	3150	77829	.	.
1320	28792	1810	84219	2413	57596	2720	69993	3150	81311	.	.
1320	28793	1810	84221	2413	57597	2720	69994	3150	81312	.	.
1320	28799	1810	84222	2421	5911	2720	69995	3150	81313	.	.
1320	28911	1810	8423	2421	5912	2720	69999	3150	81315	.	.
1320	28919	1810	8424	2421	5913	2720	97101	3150	81317	.	.
1410	27311	1810	8425	2421	59141	2720	97102	3150	8132	.	.
1410	27312	1810	8426	2421	59149	2811	69111	3150	8138	.	.
1410	27313	1810	8427	2422	53321	2811	69112	3150	81399	.	.
1410	27322	1810	84281	2422	53329	2811	69113	3150	88112	.	.
1410	27323	1810	84282	2422	53341	2811	69114	3150	89841	.	.
1410	27331	1810	84289	2422	53342	2811	69119	3190	74521	.	.
1410	27339	1810	8431	2422	53343	2811	69121	3190	77313	.	.
1410	2734	1810	84321	2422	53344	2811	69129	3190	77324	.	.
1410	27823	1810	84322	2422	53351	2811	8110	3190	77329	.	.
1410	27826	1810	84323	2422	53352	2812	69211	3190	77812	.	.
1410	27827	1810	84324	2422	53353	2812	69212	3190	77831	.	.
1410	27829	1810	84371	2422	53354	2812	69243	3190	77833	.	.
1410	27891	1810	84379	2422	53355	2812	69244	3190	77834	.	.
1421	27231	1810	84381	2423	51393	2812	81211	3190	77835	.	.
1421	27232	1810	84382	2423	51461	2813	71111	3190	77871	.	.
1421	2724	1810	84389	2423	51464	2813	71112	3190	77878	.	.
1421	2741	1810	8441	2423	51471	2813	71121	3190	77879	.	.
1421	27411	1810	84421	2423	51479	2813	71122	3190	77881	.	.
1421	2742	1810	84422	2423	51481	2813	71191	3190	77882	.	.
1421	27854	1810	84423	2423	51563	2813	71192	3190	77883	.	.
1421	27855	1810	84424	2423	51569	2813	71871	3190	77884	.	.
1421	27892	1810	84425	2423	51571	2813	71878	3190	77885	.	.
1421	27894	1810	84426	2423	51572	2893	6951	3190	77886	.	.
1421	27899	1810	8447	2423	51576	2893	69521	3190	77889	.	.
1422	2783	1810	84481	2423	51578	2893	69522	32	76493	.	.
1429	27711	1810	84482	2423	5158	2893	69523	3210	7722	.	.
1429	27722	1810	84483	2423	51692	2893	6953	3210	77231	.	.
1429	27729	1810	84489	2423	54111	2893	69541	3210	77232	.	.
1429	27822	1810	84511	2423	54112	2893	69542	3210	77233	.	.
1429	27824	1810	84512	2423	54113	2893	69543	3210	77235	.	.
1429	27825	1810	84521	2423	54114	2893	69544	3210	77238	.	.
1429	2784	1810	84522	2423	54115	2893	69545	3210	77611	.	.
1429	27851	1810	84523	2423	54116	2893	69546	3210	77612	.	.
1429	27852	1810	84524	2423	54117	2893	69547	3210	77621	.	.
1429	27853	1810	84551	2423	54131	2893	69548	3210	77623	.	.
1429	27869	1810	84552	2423	54132	2893	69549	3210	77625	.	.
1429	27893	1810	84561	2423	54133	2893	6955	3210	77627	.	.
1429	27895	1810	84562	2423	54139	2893	69551	3210	77629	.	.
1429	27897	1810	84563	2423	54141	2893	69552	3210	77631	.	.
1429	27898	1810	84564	2423	54142	2893	69553	3210	77632	.	.
1429	66721	1810	84581	2423	54143	2893	69554	3210	77633	.	.
1429	66722	1810	84587	2423	54144	2893	69555	3210	77635	.	.
1429	66731	1810	84589	2423	54145	2893	69559	3210	77637	.	.
1511	01111	1810	84591	2423	54146	2893	69561	3210	77639	.	.
1511	01112	1810	84592	2423	54147	2893	69562	3210	77641	.	.
1511	01121	1810	84599	2423	54149	2893	69563	3210	77643	.	.
1511	01122	1810	84611	2423	54151	2893	69564	3210	77645	.	.
1511	01211	1810	84612	2423	54152	2893	6957	3210	77649	.	.
1511	01212	1810	84613	2423	54153	2893	69631	3210	77681	.	.
1511	01213	1810	84614	2423	54159	2893	69635	3210	77688	.	.
1511	01221	1810	84619	2423	54161	2893	69638	3210	77689	.	.
1511	01222	1810	84691	2423	54162	2893	6964	3210	77861	.	.
1511	01231	1810	84692	2423	54163	2893	69651	3210	77862	.	.
1511	0132	1810	84693	2423	54164	2893	69655	3210	77863	.	.
1511	01233	1810	84694	2423	54191	2893	69659	3210	77864	.	.
1511	01234	1810	84699	2423	54192	2893	69661	3210	77865	.	.
1511	01235	1810	84811	2423	54193	2893	69662	3210	77866	.	.
1511	01236	1810	84812	2423	54199	2893	69663	3210	77867	.	.
1511	0124	1810	84813	2423	54211	2893	69669	3210	77868	.	.
1511	01251	1810	84819	2423	54212	2893	6968	3210	77869	.	.
1511	01252	1810	84841	2423	54213	2893	69911	3220	76381	.	.
1511	01253	1810	84842	2423	54219	2899	69241	3220	7641	.	.
1511	01254	1810	84843	2423	54221	2899	69242	3220	76411	.	.
1511	01255	1810	84848	2423	54222	2899	69311	3220	76413	.	.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
1511	01256	1810	84849	2423	54223	2899	69312	3220	76415	.	.
1511	01291	1820	61311	2423	54224	2899	69313	3220	76417	.	.
1511	01299	1820	61312	2423	54229	2899	6932	3220	76419	.	.
1511	01611	1820	61313	2423	54231	2899	69351	3220	76431	.	.
1511	01612	1820	61319	2423	54232	2899	69352	3220	76432	.	.
1511	01619	1820	6132	2423	54291	2899	6941	3220	76482	.	.
1511	01681	1820	6133	2423	54292	2899	69421	3220	76491	.	.
1511	01689	1820	84831	2423	54293	2899	69422	3230	7611	.	.
1511	0171	1820	84832	2424	51222	2899	69431	3230	7612	.	.
1511	0172	1911	6112	2424	5531	2899	69432	3230	76211	.	.
1511	0173	1911	6113	2424	5532	2899	69433	3230	76212	.	.
1511	0174	1911	61141	2424	5533	2899	6944	3230	76221	.	.
1511	0175	1911	61142	2424	5534	2899	69741	3230	76222	.	.
1511	0176	1911	61151	2424	55351	2899	69742	3230	76281	.	.
1511	0179	1911	61152	2424	55352	2899	69743	3230	76282	.	.
1511	08141	1911	61161	2424	55353	2899	69744	3230	76289	.	.
1511	21111	1911	61162	2424	55354	2899	69751	3230	76331	.	.
1511	21112	1911	61171	2424	55359	2899	69752	3230	76333	.	.
1511	21113	1911	61172	2424	55411	2899	69753	3230	76335	.	.
1511	2112	1911	61179	2424	55415	2899	69781	3230	76381	.	.
1511	2114	1911	61181	2424	55419	2899	69782	3230	76382	.	.
1511	2116	1911	61183	2424	55421	2899	69912	3230	76383	.	.
1511	2117	1912	6121	2424	55422	2899	69913	3230	76384	.	.
1511	26819	1912	6122	2424	55423	2899	69914	3230	76421	.	.
1511	4112	1912	6129	2424	55431	2899	69915	3230	76422	.	.
1511	41131	1912	83111	2424	55432	2899	69916	3230	76423	.	.
1511	41132	1912	83112	2424	55433	2899	69917	3230	76424	.	.
1512	03637	1912	83119	2424	55434	2899	69919	3230	76425	.	.
1512	03639	1912	83121	2424	55435	2899	69921	3230	76426	.	.
1512	03711	1912	83122	2424	59831	2899	69922	3230	76481	.	.
1512	03712	1912	83129	2424	59835	2899	69931	3230	76492	.	.
1512	03713	1912	8313	2424	59839	2899	69932	3230	76499	.	.
1512	03714	1912	83191	2429	4311	2899	69933	3311	74183	.	.
1512	03715	1912	83199	2429	55131	2899	69941	3311	77411	.	.
1512	03716	1912	88593	2429	55132	2899	69942	3311	77412	.	.
1512	03717	1920	85111	2429	55133	2899	69951	3311	77413	.	.
1512	03721	1920	85113	2429	55135	2899	69952	3311	77421	.	.
1512	03722	1920	85115	2429	55141	2899	69953	3311	77422	.	.
1512	08142	1920	85121	2429	55149	2899	69954	3311	77423	.	.
1512	29196	1920	85122	2429	59222	2899	69955	3311	77429	.	.
1512	03419	1920	85123	2429	59223	2899	69961	3311	87211	.	.
1512	03421	1920	85124	2429	59224	2899	69962	3311	87219	.	.
1512	03422	1920	85125	2429	59225	2899	69963	3311	87221	.	.
1512	03423	1920	85131	2429	59227	2899	69965	3311	87225	.	.
1512	03424	1920	85132	2429	59229	2899	69967	3311	87229	.	.
1512	03425	1920	85141	2429	59311	2899	69969	3311	87231	.	.
1512	03426	1920	85142	2429	59312	2899	69971	3311	87233	.	.
1512	03427	1920	85148	2429	5932	2899	69973	3311	87235	.	.
1512	03428	1920	85149	2429	59331	2899	69975	3311	8724	.	.
1512	03429	1920	85151	2429	59333	2899	69976	3311	89961	.	.
1512	0344	1920	85152	2429	59721	2899	69977	3311	89963	.	.
1512	03451	1920	85159	2429	59725	2899	69978	3311	89965	.	.
1512	03455	1920	8517	2429	59729	2899	69979	3311	89966	.	.
1512	03511	1920	8519	2429	59731	2899	74991	3311	89967	.	.
1512	03512	2010	24611	2429	59733	2899	89113	3311	89969	.	.
1512	03513	2010	24615	2429	59771	2899	89511	3312	76483	.	.
1512	03521	2010	2473	2429	59772	2899	89512	3312	87131	.	.
1512	03522	2010	24811	2429	59773	2911	71211	3312	87139	.	.
1512	03529	2010	24819	2429	59774	2911	71219	3312	87311	.	.
1512	0353	2010	2482	2429	59841	2911	7128	3312	87313	.	.
1512	0354	2010	2483	2429	59845	2911	71331	3312	87315	.	.
1512	0355	2010	2484	2429	5985	2911	71332	3312	87319	.	.
1512	03611	2010	2485	2429	59863	2911	71333	3312	87321	.	.
1512	03619	2010	63493	2429	59864	2911	71381	3312	87325	.	.
1513	05461	2021	63411	2429	59867	2911	71382	3312	87329	.	.
1513	05469	2021	63412	2429	59869	2911	71489	3312	87411	.	.
1513	0547	2021	63421	2429	59881	2911	71499	3312	87412	.	.
1513	05485	2021	63422	2429	59883	2911	71811	3312	87413	.	.
1513	05611	2021	63423	2429	59885	2911	71819	3312	87414	.	.
1513	05612	2021	63431	2429	59889	2912	71891	3312	87422	.	.
1513	05613	2021	63439	2429	59891	2912	71892	3312	87423	.	.
1513	05619	2021	63441	2429	59893	2912	71893	3312	87424	.	.
1513	05641	2021	63449	2429	59894	2912	71899	3312	87425	.	.
1513	05642	2021	63451	2429	59895	2912	74211	3312	87426	.	.
1513	05661	2021	63452	2429	59896	2912	74219	3312	87431	.	.
1513	05669	2021	63453	2429	59897	2912	7422	3312	87435	.	.
1513	05671	2021	63459	2429	59899	2912	7423	3312	87437	.	.
1513	05672	2022	63531	2429	8821	2912	7424	3312	87439	.	.
1513	05673	2022	63532	2429	8822	2912	7425	3312	87441	.	.
1513	05674	2022	63533	2429	8823	2912	7426	3312	87442	.	.
1513	05675	2022	63539	2429	8824	2912	74271	3312	87443	.	.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
1513	05676	2023	63511	2429	89591	2912	74275	3312	87444	.	.
1513	05677	2023	63512	2429	89841	2912	74291	3312	87445	.	.
1513	05679	2023	6352	2429	89843	2912	74295	3312	87446	.	.
1513	0581	2029	24402	2429	89845	2912	74311	3312	87449	.	.
1513	05821	2029	24404	2429	89851	2912	74313	3312	87451	.	.
1513	05822	2029	63311	2429	89859	2912	74315	3312	87453	.	.
1513	05831	2029	63319	2430	26651	2912	74317	3312	87454	.	.
1513	05832	2029	63321	2430	26652	2912	74319	3312	87455	.	.
1513	05839	2029	63329	2430	26653	2912	7438	3312	87456	.	.
1513	05892	2029	63541	2430	26659	2912	7471	3312	87461	.	.
1513	05893	2029	63542	2430	26661	2912	7472	3312	87463	.	.
1513	05894	2029	63549	2430	26662	2912	7473	3312	87465	.	.
1513	05895	2029	63591	2430	26663	2912	7474	3312	87471	.	.
1513	05896	2029	63599	2430	26669	2912	7478	3312	87473	.	.
1513	05897	2029	89971	2430	26711	2912	7479	3312	87475	.	.
1513	0591	2029	89973	2430	26712	2913	7461	3312	87477	.	.
1513	0592	2029	89974	2430	65151	2913	7462	3312	87478	.	.
1513	0593	2029	89979	2430	65152	2913	7463	3312	87479	.	.
1513	05991	2101	2512	2430	65159	2913	7464	3312	8749	.	.
1513	05992	2101	2513	2430	65162	2913	7465	3313	87469	.	.
1513	05993	2101	25141	2430	65163	2913	7468	3320	87111	.	.
1513	05994	2101	25142	2430	65164	2913	74691	3320	87115	.	.
1513	05995	2101	25151	2430	65172	2913	74699	3320	87119	.	.
1513	05996	2101	25152	2430	65173	2913	7481	3320	87141	.	.
1514	08131	2101	25161	2430	65174	2913	74821	3320	87143	.	.
1514	08132	2101	25162	2430	65175	2913	74822	3320	87145	.	.
1514	08133	2101	25191	2430	65177	2913	74831	3320	87149	.	.
1514	08134	2101	25192	2430	65188	2913	74832	3320	87191	.	.
1514	08135	2101	6411	2511	62121	2913	74839	3320	87192	.	.
1514	08136	2101	64121	2511	6251	2913	7484	3320	87193	.	.
1514	08137	2101	64122	2511	6252	2913	7485	3320	87199	.	.
1514	08138	2101	64123	2511	6253	2913	7486	3320	88111	.	.
1514	08139	2101	64124	2511	62541	2913	7489	3320	88113	.	.
1514	09101	2101	64125	2511	62542	2914	74121	3320	88114	.	.
1514	09109	2101	64126	2511	62551	2914	74123	3320	88115	.	.
1514	2239	2101	64127	2511	62559	2914	74125	3320	88121	.	.
1514	2632	2101	64129	2511	62591	2914	74128	3320	88122	.	.
1514	41111	2101	64131	2511	62592	2914	74131	3320	88123	.	.
1514	41112	2101	64132	2511	62594	2914	74132	3320	88124	.	.
1514	41113	2101	64133	2519	29221	2914	74133	3320	88131	.	.
1514	41133	2101	64134	2519	62111	2914	74134	3320	88132	.	.
1514	41139	2101	64141	2519	62112	2914	74135	3320	88133	.	.
1514	42111	2101	64142	2519	62119	2914	74136	3320	88134	.	.
1514	42119	2101	64146	2519	62129	2914	74138	3320	88135	.	.
1514	42121	2101	64147	2519	62131	2914	74139	3320	88136	.	.
1514	42129	2101	64148	2519	62132	2915	72391	3320	88411	.	.
1514	42131	2101	64151	2519	62133	2915	74411	3320	88415	.	.
1514	42139	2101	64152	2519	62141	2915	74412	3320	88417	.	.
1514	42141	2101	64153	2519	62142	2915	74413	3320	88419	.	.
1514	42142	2101	64154	2519	62143	2915	74414	3320	88421	.	.
1514	42149	2101	64155	2519	62144	2915	74415	3320	88422	.	.
1514	42151	2101	64156	2519	62145	2915	74419	3320	88423	.	.
1514	42159	2101	64157	2519	62911	2915	74421	3320	88431	.	.
1514	42171	2101	64158	2519	62919	2915	74423	3320	88432	.	.
1514	42179	2101	64159	2519	6292	2915	74425	3320	88433	.	.
1514	4218	2101	64161	2519	62921	2915	74431	3320	88439	.	.
1514	42211	2101	64162	2519	62929	2915	74432	3330	88531	.	.
1514	42219	2101	64163	2519	62991	2915	74433	3330	88532	.	.
1514	42221	2101	64169	2519	62992	2915	74434	3330	88539	.	.
1514	42229	2101	64171	2519	62999	2915	74435	3330	88541	.	.
1514	42231	2101	64172	2519	65733	2915	74437	3330	88542	.	.
1514	42239	2101	64173	2519	84822	2915	74439	3330	88549	.	.
1514	42241	2101	64174	2519	84829	2915	74441	3330	88551	.	.
1514	42249	2101	64175	2520	5811	2915	74443	3330	88552	.	.
1514	4225	2101	64176	2520	5812	2915	74449	3330	88571	.	.
1514	42291	2101	64177	2520	5813	2915	74471	3330	88572	.	.
1514	42299	2101	64178	2520	5814	2915	74473	3330	88573	.	.
1514	43121	2101	64179	2520	5815	2915	74474	3330	88574	.	.
1514	43122	2101	64191	2520	5816	2915	74479	3330	88575	.	.
1514	43133	2101	64192	2520	5817	2915	74481	3330	88576	.	.
1514	43141	2102	64164	2520	58211	2915	74485	3330	88577	.	.
1520	0243	2102	64211	2520	58219	2915	74489	3330	88578	.	.
1520	02491	2102	64212	2520	58221	2915	74491	3330	88579	.	.
1520	02499	2102	64213	2520	58222	2915	74492	3330	88591	.	.
1520	06191	2102	64214	2520	58223	2915	74493	3330	88592	.	.
1520	59221	2102	64215	2520	58224	2915	74494	3330	88594	.	.
1520	02211	2102	64216	2520	58225	2919	74143	3330	88595	.	.
1520	02212	2109	64193	2520	58226	2919	74145	3330	88596	.	.
1520	02213	2109	64194	2520	58227	2919	74149	3330	88597	.	.
1520	02221	2109	64221	2520	58228	2919	74151	3330	88598	.	.
1520	02222	2109	64222	2520	58229	2919	74155	3330	88599	.	.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
1520	02223	2109	64223	2520	58291	2919	74159	3410	71321	.	.
1520	02224	2109	64241	2520	58299	2919	74171	3410	71322	.	.
1520	02231	2109	64242	2520	5831	2919	74172	3410	71323	.	.
1520	02232	2109	64243	2520	5832	2919	74173	3410	7811	.	.
1520	02233	2109	64244	2520	5839	2919	74174	3410	7812	.	.
1520	02241	2109	64245	2520	77328	2919	74175	3410	78211	.	.
1520	02249	2109	64248	2520	81392	2919	74189	3410	78219	.	.
1520	0230	2109	64291	2520	84821	2919	7419	3410	78221	.	.
1520	0241	2109	64292	2520	84844	2919	74343	3410	78223	.	.
1520	0242	2109	64293	2520	84845	2919	74359	3410	78225	.	.
1531	0422	2109	64294	2520	89311	2919	74361	3410	78227	.	.
1531	04231	2109	64295	2520	89319	2919	74362	3410	78229	.	.
1531	04232	2109	64299	2520	89321	2919	74363	3410	78311	.	.
1531	0461	2109	65735	2520	89329	2919	74364	3410	78319	.	.
1531	0462	2109	65911	2520	89331	2919	74367	3410	7832	.	.
1531	04711	2109	89281	2520	89332	2919	74369	3410	7841	.	.
1531	04719	2211	89212	2520	89394	2919	74391	3420	78421	.	.
1531	04721	2211	89213	2520	89395	2919	74395	3420	78425	.	.
1531	04722	2211	89214	2520	89399	2919	74523	3420	7861	.	.
1531	04729	2211	89215	2610	65195	2919	74527	3420	78622	.	.
1531	04811	2211	89216	2610	6546	2919	74531	3420	78629	.	.
1531	04812	2211	89219	2610	66411	2919	74532	3420	7863	.	.
1531	04813	2211	89285	2610	66412	2919	74539	3420	78683	.	.
1531	04814	2212	89221	2610	66431	2919	74561	3420	78689	.	.
1531	04815	2212	89229	2610	66439	2919	74562	3430	71391	.	.
1531	0485	2213	8986	2610	66441	2919	74563	3430	71392	.	.
1531	05646	2213	89861	2610	66442	2919	74565	3430	78431	.	.
1531	05647	2213	89865	2610	66451	2919	74568	3430	78432	.	.
1531	05648	2213	89867	2610	66452	2919	74591	3430	78433	.	.
1532	05645	2213	89871	2610	66453	2919	74593	3430	78434	.	.
1532	06193	2213	89879	2610	66471	2919	74595	3430	78435	.	.
1532	06194	2219	89241	2610	66472	2919	74597	3430	78436	.	.
1532	06195	2219	89242	2610	66481	2919	7492	3430	78439	.	.
1532	06196	2219	89283	2610	66489	2919	74999	3511	79322	.	.
1532	06199	2219	89284	2610	66491	2921	72111	3511	79324	.	.
1532	42161	2219	89287	2610	66492	2921	72112	3511	79326	.	.
1532	42169	2219	89289	2610	66493	2921	72113	3511	79327	.	.
1532	59211	2221	64231	2610	66494	2921	72118	3511	79328	.	.
1532	59212	2221	64232	2610	66495	2921	72119	3511	79329	.	.
1532	59213	2221	64233	2610	66496	2921	72121	3511	79351	.	.
1532	59214	2221	64234	2610	66511	2921	72122	3511	79355	.	.
1532	59215	2221	64235	2610	66512	2921	72123	3511	79359	.	.
1532	59216	2221	64239	2610	66521	2921	72126	3511	7937	.	.
1532	59217	2221	89286	2610	66522	2921	72127	3511	79391	.	.
1532	59226	2222	72635	2610	66523	2921	72129	3511	79399	.	.
1533	08195	2310	33521	2610	66529	2921	72131	3512	79311	.	.
1533	08199	2310	33521	2610	66591	2921	72195	3512	79312	.	.
1541	04841	2320	33411	2610	66592	2921	72196	3512	79319	.	.
1541	04842	2320	33511	2610	66593	2921	72199	3520	79111	.	.
1541	04849	2320	33512	2610	66594	2921	72241	3520	79115	.	.
1542	06111	2320	33541	2610	66595	2921	72249	3520	79121	.	.
1542	06112	2320	33542	2610	66599	2921	74564	3520	79129	.	.
1542	06121	2320	3421	2610	77322	2921	78621	3520	7916	.	.
1542	06129	2320	3425	2610	81391	2922	72811	3520	7917	.	.
1542	06151	2320	3441	2691	66391	2922	72812	3520	79181	.	.
1542	06159	2320	3442	2691	66399	2922	72819	3520	79182	.	.
1542	06192	2320	3449	2691	66611	2922	72844	3520	79191	.	.
1543	0621	2330	52511	2691	66612	2922	73111	3520	79199	.	.
1543	06221	2330	52513	2691	66613	2922	73112	3530	71311	.	.
1543	06229	2330	52515	2691	66621	2922	73113	3530	71319	.	.
1543	0722	2330	52519	2691	66629	2922	73114	3530	71441	.	.
1543	07231	2330	71877	2691	77323	2922	73121	3530	71449	.	.
1543	07232	2411	24502	2691	77326	2922	73122	3530	71481	.	.
1543	0724	2411	27419	2691	81221	2922	73123	3530	71491	.	.
1543	0731	2411	2814	2691	81229	2922	73131	3530	79211	.	.
1543	0732	2411	33522	2692	66231	2922	73135	3530	79215	.	.
1543	0733	2411	33523	2692	66232	2922	73137	3530	7922	.	.
1543	0739	2411	33524	2692	66233	2922	73139	3530	7923	.	.
1544	0483	2411	33525	2692	66338	2922	73141	3530	7924	.	.
1544	09891	2411	33531	2692	6637	2922	73142	3530	7925	.	.
1549	02521	2411	33532	2693	66241	2922	73143	3530	79281	.	.
1549	02522	2411	43131	2693	66242	2922	73144	3530	79282	.	.
1549	0253	2411	51111	2693	66243	2922	73145	3530	79283	.	.
1549	07112	2411	51112	2693	66244	2922	73146	3530	79291	.	.
1549	0712	2411	51113	2693	66245	2922	73151	3530	79293	.	.
1549	07131	2411	51114	2694	27324	2922	73152	3530	79295	.	.
1549	07132	2411	51119	2694	66111	2922	73153	3530	79297	.	.
1549	07133	2411	51121	2694	66112	2922	73154	3591	78511	.	.
1549	07411	2411	51122	2694	66113	2922	73157	3591	78513	.	.
1549	07413	2411	51123	2694	66121	2922	73161	3591	78515	.	.
1549	07432	2411	51124	2694	66122	2922	73162	3591	78516	.	.

Table B.1: Correspondence of SITC and ISIC Classification (Continued)

Conversion table		(continued)		(continued)		(continued)		(continued)		(continued)	
ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3	ISICrev3	SITCrev3
1549	09811	2411	51125	2694	66123	2922	73163	3591	78517	.	.
1549	09812	2411	51126	2694	66129	2922	73164	3591	78519	.	.
1549	09813	2411	51127	2695	59898	2922	73165	3591	78535	.	.
1549	09814	2411	51129	2695	66182	2922	73166	3592	7852	.	.
1549	09841	2411	51131	2695	66183	2922	73167	3592	78531	.	.
1549	09842	2411	51132	2695	66331	2922	73169	3592	78536	.	.
1549	09843	2411	51133	2695	66332	2922	73171	3592	78537	.	.
1549	09844	2411	51134	2695	66333	2922	73173	3599	78685	.	.
1549	09849	2411	51135	2695	66334	2922	73175	3610	82111	.	.
1549	0985	2411	51136	2696	66131	2922	73177	3610	82112	.	.
1549	0986	2411	51137	2696	66132	2922	73178	3610	82113	.	.
1549	09893	2411	51138	2696	66133	2922	73179	3610	82114	.	.
1549	09894	2411	51139	2696	66134	2922	73311	3610	82115	.	.
1549	09899	2411	5114	2696	66135	2922	73312	3610	82116	.	.
1551	11241	2411	51211	2696	66136	2922	73313	3610	82117	.	.
1551	11242	2411	51212	2696	66139	2922	73314	3610	82118	.	.
1551	11243	2411	51213	2699	33543	2922	73315	3610	82119	.	.
1551	11244	2411	51214	2699	52267	2922	73316	3610	82121	.	.
1551	11245	2411	51217	2699	59861	2922	73317	3610	82123	.	.
1551	11249	2411	51219	2699	66181	2922	73318	3610	82125	.	.
1551	51215	2411	51221	2699	66311	2922	73391	3610	82131	.	.
1551	51216	2411	51223	2699	66312	2922	73393	3610	82139	.	.
1552	11211	2411	51224	2699	66313	2922	73395	3610	82151	.	.
1552	11213	2411	51225	2699	66321	2922	73399	3610	82153	.	.
1552	11215	2411	51229	2699	66322	2922	73511	3610	82155	.	.
1552	11217	2411	51231	2699	66329	2922	73513	3610	82159	.	.
1552	1122	2411	51235	2699	66335	2922	73515	3610	82171	.	.
1553	0482	2411	51241	2699	66336	2922	73591	3610	82179	.	.
1553	1123	2411	51242	2699	66337	2922	73595	3610	8218	.	.
1554	11101	2411	51243	2699	66339	2922	73731	3691	27719	.	.
1554	11102	2411	51244	2699	66351	2922	73732	3691	27721	.	.
1600	1221	2411	51371	2699	66352	2922	73733	3691	66713	.	.
1600	1222	2411	51372	2699	66353	2922	73734	3691	66729	.	.
1600	12231	2411	51373	2699	66381	2922	73735	3691	66739	.	.
1600	12232	2411	51374	2699	66382	2922	73736	3691	66749	.	.
1600	12239	2411	51375	2710	67121	2922	73737	3691	89731	.	.
1711	65197	2411	51376	2710	67122	2922	73739	3691	89732	.	.
1711	65199	2411	51377	2710	67123	2922	73741	3691	89733	.	.
1711	65211	2411	51378	2710	67131	2922	73742	3691	89741	.	.
1711	65212	2411	51379	2710	67132	2922	73743	3691	89749	.	.
1711	65213	2411	51381	2710	67133	2922	73749	3691	9610	.	.
1711	65214	2411	51382	2710	67141	2922	74511	3692	89813	.	.
1711	65215	2411	51383	2710	67149	2922	74512	3692	89815	.	.
1711	65221	2411	51384	2710	67151	2922	74519	3692	89821	.	.
1711	65222	2411	51385	2710	67152	2922	77841	3692	89822	.	.
1711	65223	2411	51389	2710	67153	2922	77843	3692	89823	.	.
1711	65224	2411	51391	2710	67154	2922	77845	3692	89824	.	.
1711	65225	2411	51392	2710	67155	2922	77848	3692	89825	.	.
1711	65226	2411	51394	2710	67159	2923	73711	3692	89826	.	.
1711	65231	2411	51395	2710	67241	2923	73712	3692	89829	.	.
1711	65232	2411	51396	2710	67245	2923	73719	3692	8989	.	.
1711	65233	2411	51451	2710	67247	2923	73721	3693	89471	.	.
1711	65234	2411	51452	2710	67249	2923	73729	3693	89472	.	.
1711	65241	2411	51453	2710	67261	2924	7223	3693	89473	.	.
1711	65242	2411	51454	2710	67262	2924	72311	3693	89474	.	.
1711	65243	2411	51455	2710	67269	2924	72312	3693	89475	.	.
1711	65244	2411	51461	2710	6727	2924	72321	3693	89476	.	.
1711	65245	2411	51462	2710	67281	2924	72322	3693	89477	.	.
1711	65251	2411	51463	2710	67282	2924	72329	3693	89478	.	.
1711	65252	2411	51465	2710	673	2924	72331	3693	89479	.	.
1711	65253	2411	51467	2710	67311	2924	72333	3694	89421	.	.
1711	65254	2411	51473	2710	67312	2924	72335	3694	89422	.	.
1711	65261	2411	51482	2710	67313	2924	72337	3694	89423	.	.
1711	65262	2411	51483	2710	67314	2924	72339	3694	89424	.	.
1711	65263	2411	51484	2710	67315	2924	72341	3694	89425	.	.
1711	65264	2411	51485	2710	67316	2924	72342	3694	89426	.	.

B.1.2 Manufacturing Industry Classification

The industry sector level classification used in this section follows the International Standard Industrial Classification (ISIC), Revision 3 data base by the United Nations Statistics Division (INDSTAT, 2020). The ISIC combinations chosen for this report are presented in Table B.3 and were defined with the objective of having a straight-forward correspondence between different data sources and classification standards in order to guarantee a consistent definition of manufacturing sectors throughout this report that can also be applied easily to different classification formats. With regards to the technology classification of the industries, all manufacturing industries are further classified by their technology intensity following the technology classification of the Organisation for Economic Co-operation and Development (OECD) which is based on research and development (R&D) intensity relative to value-added and gross production statistics (OECD, 2011). The OECD classifies manufacturing industries into four categories of high technology, medium high technology, medium-low technology and low technology industries.

Table B.2 Classification of manufacturing sectors by technological intensity, ISIC Rev. 3 4-digits

Abbreviation	ISIC Rev.3 Industry Description	ISIC Industry Combination		
		Revision 3	Revision 4	Technology Group
Food and beverages	Manufacture of food products and beverages	15	10 + 11	Low
Tobacco	Manufacture of tobacco products	16	12	Low
Textiles	Manufacture of textiles	17	13	Low
Wearing apparel	Manufacture of wearing apparel; dressing and dyeing of fur + Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	18 + 19	14 + 15	Low
Wood products	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	20	16	Low
Paper and paper products	Manufacture of paper and paper products	21	17	Low
Printing and publishing	Publishing, printing and reproduction of recorded media	22	18	Low
Coke, petroleum and nuclear	Manufacture of coke, refined petroleum products and nuclear fuel	23	19	Medium-low
Chemicals	Manufacture of chemicals and chemical products	24	20 + 21	Medium-high
Rubber and plastic	Manufacture of rubber and plastics products	25	22	Medium-low
Non-metallic minerals	Manufacture of other non-metallic mineral products	26	23	Medium-low
Basic metals	Manufacture of basic metals	27	24	Medium-low
Fabricated metals	Manufacture of fabricated metal products, except machinery and equipment	28	25	Medium-low
Machinery	Manufacture of machinery and equipment n.e.c.	29	28 + 33	Medium-high
Computer and electronics	Manufacture of office, accounting and computing machinery + Manufacture of radio, television and communication equipment and apparatus + Manufacture of medical, precision and optical instruments, watches and clocks	30 + 32 + 33	26	High
Electrical machinery	Manufacture of electrical machinery and apparatus n.e.c.	31	27	Medium-high
Motor vehicles	Manufacture of motor vehicles, trailers and semi-trailers	34	29	Medium-high

Table B.2 Guinea import levels per capita over time, ISIC Rev. 3 4-digits

Abbreviation	ISIC Rev.3 Industry Description	Revision 3	Revision 4	Technology Group
Transport equipment	Manufacture of other transport equipment	35	30	Medium-high
Furniture and n.e.c.	Manufacture of furniture; manufacturing n.e.c.	36	31 + 32	Low

Note: Abbreviations chosen by authors for the purpose of this analysis. Industry sector level classification used in this section follows INDSTAT (2020). Technology classification based on OECD (2011). The ISIC combinations presented in this table are defined with the objective of having a straight-forward correspondence between different data sourced and to guarantee a consistent definition of manufacturing sectors thought this report that can also be applied easily to different classification formats.

B.1.3 Industrial Export Specialization Indicator (IES)

The industry export specialization (IES) draws from the Revealed Comparative Advantage, isolating the manufacturing industry from the rest of the economy in order to capture properly the movements of this dimension, since it is significantly lower than the agricultural and mining industries in Guinea.

Following Balassa (1965)'s Revealed Comparative Advantage, the IES for country i in good j is given by:

$$IES = \frac{X_j^i / X^i}{X_j / X}$$

where X_j^i is country i 's export of good j , $X^i = \sum_j X_j^i$ is country i 's aggregate exports, X_j is world exports of good j , and $X = \sum_j X_j$ is world aggregate exports.

Typically, when mapping SITC to ISIC, many SITC commodities are assigned to one particular ISIC aggregate. Therefore, in order to get from commodity-level data to industry-level data aggregation is necessary which is done as follows: Suppose good j belongs to ISIC sector s ; calculate the weighted average IES of sector s for country i (where N_s denotes the number of goods j in sector s) as:

$$IES_s^i = \frac{1}{N_s} \sum_{j \in s} w_j^i \times IES_j^i, \quad w_j^i = \frac{X_j^i}{\sum_{j \in s} X_j^i}$$

Conversely, for any *un-weighted* IES, $w_j^i = 1$ for any j and i .

B.1.4 Econometric model

Construction of Database. The two databases constructed for the econometric modelling combine nominal gross exports data from UN-COMTRADE (2020) as well as employment data from INDSTAT (2020). Correspondence between both SITC goods classifications and the manufacturing sector classification following the procedure outlined in Section B.1.1 and allows for a separate II-digit as well as IV-digit ISIC Rev. 3 sector aggregation of the gross export data. For employment, different INDSTAT (2020) data for the II- and IV-digit sector analysis are sourced. In a next step, the sector level data

is merged with macroeconomic variables taken from Feenstra et al. (2015a) and income group classifications data is taken from World Bank (2019c).

Econometric Model. We estimate a panel fixed effects model in order to analyze the development patterns for j industry aggregates of manufacturing of which the group of X industries is discussed in greater depth. For each industry aggregate j we estimate

$$y_{cjt} = \alpha_{cj} + \beta_j \mathbf{X}_{cjt} + \tau_{jt} + \epsilon_{cjt}$$

Where y_{cjt} , is the log of nominal gross exports or manufacturing employment relative to the population of country c 's industry aggregate j in period t , respectively. Please note that this model is estimated separately for all j individual industries and we retain subscript j to highlight this feature of our model. The explanatory variables in \mathbf{X} contain the logs of real GDP per capita (Expenditure side real GDP at chained PPPs) and are added in their linear, quadratic and cubic representation. Furthermore, α_{cj} and τ_{jt} denote country and time effects. GDP²⁰ and population data is taken from Penn World Table version 9.1 (Feenstra et al., 2015b) while income group data is taken from World Bank Country and Lending Groups²¹. Since the last available year of INDSTAT data is 2017 we also use the World Bank income group classification for 2017 for country classifications.

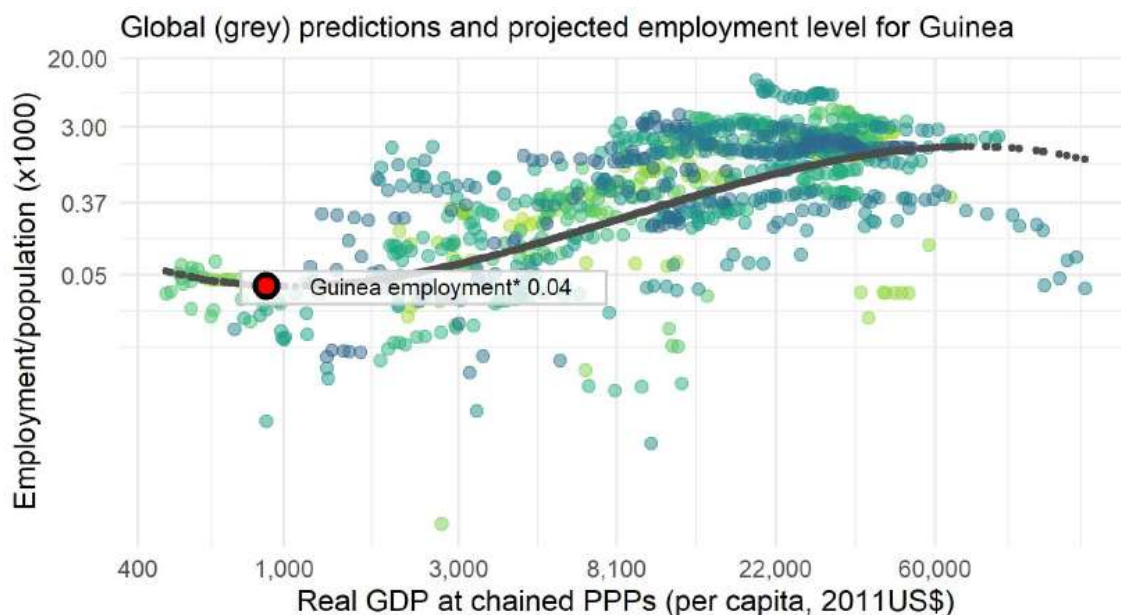
B.1.5 Employment Projections

The Employment Projections criterion provides projected national employment level based on an econometric model which is described in Section B.1.4. The results of the LCA analysis for subsector (1511) processing/preserving of meat is provided in Figure B.2 for expositional purposes. The figure plots the employment-to-population ratio obtained from INDSTAT (2020) against per capita GDP figures from Feenstra et al. (2015a) with the purpose of visualizing realized employment population across all global economies for the particular sub-sector in question. On the basis of these data, an econometric model as discussed in Section B.1.4 is employed with the objective of obtaining sector-level employment per capita trajectories conditional on the level of per capita GDP. The results for the global average trend are shown by the gray line and indicates that the sector becomes somewhat less employment intensive at higher income levels, i.e. the curve starts to flatten out from a GDP per capita level of approximately 10,000 USD while decreases after 20,00 USD. The red point corresponds to the employment-population ratio based on the model estimates of an average global economy at similar per capita GDP levels, with a similar endowment structure and a similar point of time as the latest available observation for Guinea. Similar patterns are estimated for all ISIC Rev. 3 II- and IV-digit industries and rank-ordered accordingly with the purpose of identifying the set of most employment-intensive manufacturing sectors. Global instead of Low Middle income patterns patterns are estimated for a better model.

²⁰ Variable rgdpe: Expenditure-side real GDP at chained PPPs (in mil. 2011US\$), to compare relative living standards across countries and over time.

²¹ See <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>; last visit September 2020.

Figure B.1 Employment projection for sub-sector (1511) processing/preserving of meat



Axis in log-scale. No country-level observations for Guinea available.
 *Projected employment/population ratio (x1000) for Guinea of approx. 0.04 based on 2017 real GDP per capita and identified by red point.

Note: Based on pooled cross-country data for up to 153 countries between 1963 and 2015. Income group cut-offs identified by the dashed vertical lines at USD 995, USD 3,896 and USD 12,375 as defined by World Bank Country and Lending Groups (World Bank, 2019c). Projected employment/population ratio (x1000) based on 2017 real GDP per capita. See Section B.1.4 for more information on the econometric model respectively. Source: Calculations based on (INDSTAT, 2020) and Penn World Tables 9.1 (Feenstra et al., 2015a) and following methodology described in Section B.1.4.

B.2 Supplementary Results

B.2.1 Emerging Industrial Export Specialization

Definition of concept

The Emerging Industrial Export Specialization expands on the idea of Industrial Export Specialization of the previous item and identifies sectors with an index between 0.3 and 0.9 and a positive trend over the period 2010–2018. The criterion highlights the potential to achieve industrial production and export capabilities in the future and identifies sectors that are at the brink of becoming globally competitive. In other words, it identifies sectors where the country may play a dominant role in global trade in the future.

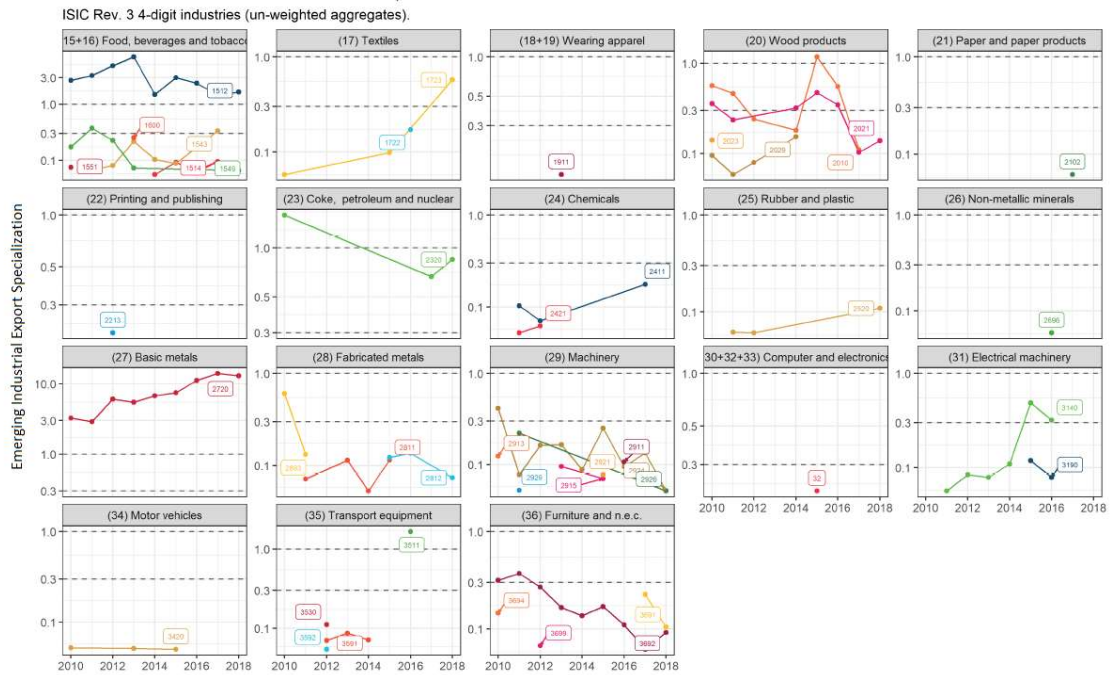
Results II-digit sector analysis

The analysis at the II-digit level indicates that there are no manufacturing sectors that continuously follow the assigned characteristics through time as can be seen in Figure B.2.

Data from sector (23) *Coke, refined petroleum products* shows an EIES index between 0.5 and 1.0 in 2017 and 2018. However, this is not a solid base to infer Guinea is moving towards the creation of production and export capabilities in this sector, and that it could be a potential avenue for the country's industrial development based on the emerging export specialization concept.

An erratic tentative towards rising its export specialization is also observed in sector (20) wood and products of wood and cork, except furniture. But not only was it not consistent over the years, since 2015 the sector also exhibited a downward trend, making evident the lack of capabilities to do so.

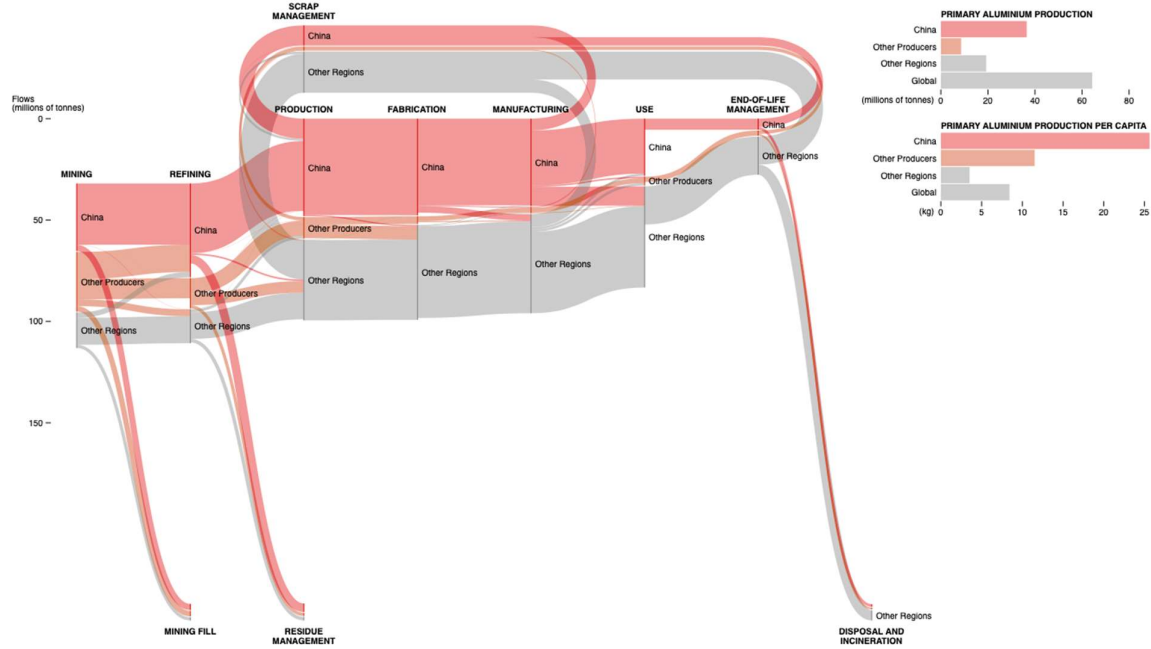
Figure B.2: Guinea: Emerging Industrial Export Specialization, ISIC Rev. 3 4-digits, over time Guinea import levels per capita over time, ISIC Rev. 3 4-digits



Note: ISIC Rev. 3 2-digit industries as described in Section B.1.2. Concordance between trade and industry classifications according to Section B.1.1. IESs calculated as described in Section B.1.3. Source: United Nations Comtrade Database (UN-COMTRADE, 2020).

B.2.2 Existing Sectoral Upgrading Potential

Figure B.3: Global Aluminium Cycle 2018



Source: World Aluminum - International Aluminium Institute

B.2.3 Import Substitution Potential

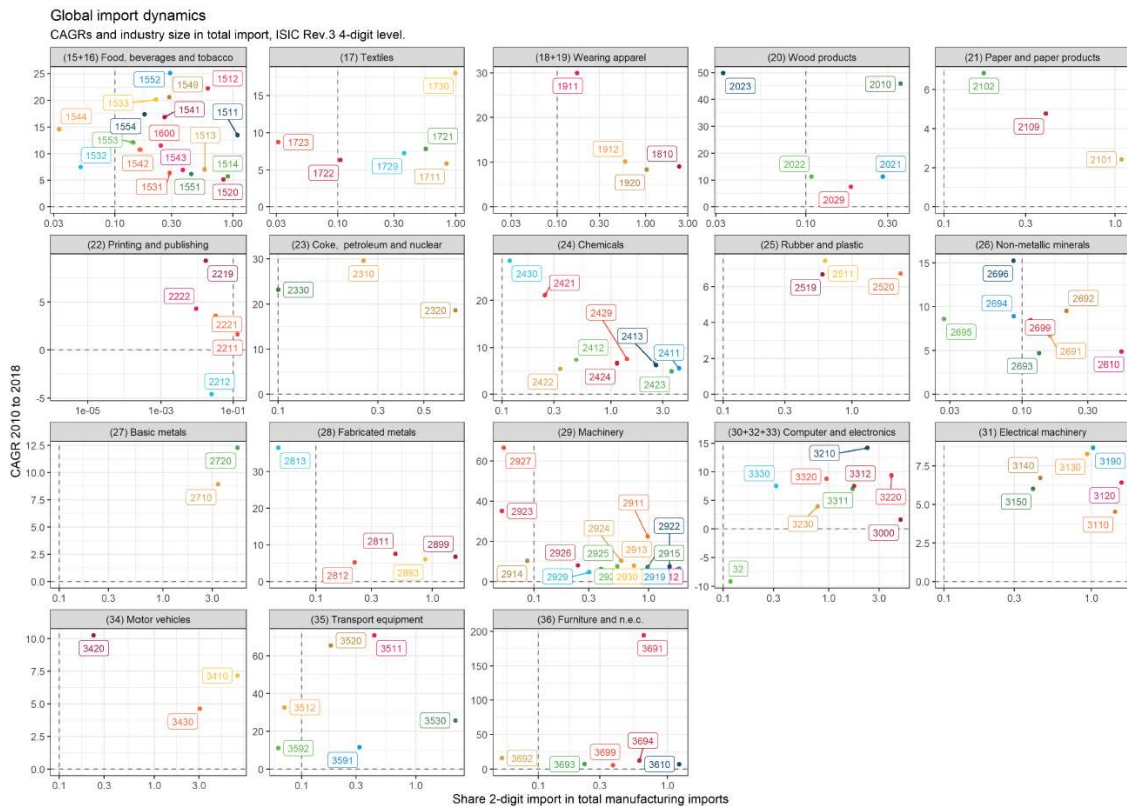
Table B.3 Guinea import levels per capita over time, ISIC Rev. 3 4-digits

II-digit sector	ISIC Rev. 3 IV-digit sectors	Year			
		2015	2016	2017	2018
(15+16) Food, beverages and tobacco	1531	15.722	19.758	19.526	25.248
	1549	7.543	8.264	9.821	9.890
(17) Textiles	1711	10.371	9.180	8.097	8.213
	1721	2.061	3.001	1.762	1.553
(18+19) Wearing apparel	1920	9.377	8.197	7.894	8.283
	1810	9.570	8.607	7.137	4.640
(20) Wood products	2022	0.225	0.254	0.185	0.108
	2029	0.062	0.092	0.125	0.100
(21) Paper and paper products	2109	1.858	2.096	2.006	1.930
	2102	1.167	1.218	0.956	1.264
(22) Printing and publishing	2219	0.972	0.927	0.523	0.862
	2211	0.246	0.203	0.198	0.542
(23) Coke, petroleum and nuclear	2320	0.519	0.329	0.274	0.426
	2310	0.000	0.001	0.001	0.009
(24) Chemicals	2423	8.102	11.224	11.050	11.297
	2411	2.174	2.626	3.073	5.357
(25) Rubber and plastic	2520	6.767	5.857	6.570	5.866
	2511	2.654	3.034	3.101	2.706
(26) Non-metallic minerals	2694	3.388	2.970	3.506	4.292
	2696	0.659	0.178	0.506	2.707
(27) Basic metals	2710	9.138	7.747	9.837	13.315
	2720	0.849	0.685	0.895	4.526
(28) Fabricated metals	2811	3.256	2.847	5.360	7.154
	2899	6.119	4.853	5.906	7.154
(29) Machinery	2924	9.446	7.975	13.239	10.710
	2915	2.693	2.258	3.391	5.296
(30+32+33) Computer and electronics	3220	3.950	1.546	4.295	5.433
	3311	0.682	0.762	0.785	2.274
(31) Electrical machinery	3110	6.890	3.444	4.787	5.784
	3120	2.478	1.961	2.555	3.181
(34) Motor vehicles	3410	13.229	12.636	21.044	17.603
	3430	2.781	2.909	3.328	3.524
(35) Transport equipment	3591	8.963	8.934	10.805	9.168
	3511	2.624	4.544	4.763	5.243
(36) Furniture and n.e.c.	3699	7.310	6.893	6.957	6.954
	3610	3.495	2.924	2.800	2.725

Note: ISIC Rev. 3 II-digit results based on averages of ISIC Rev. 3 IV-digit aggregates. Per capita figures used to account for population-driven demand effects.

B.2.4 Global Dynamics

Figure B.4: Global Import CAGR vs. sector share, ISIC Rev. 3 4-digits, 2010-2018



Note: ISIC Rev. 3 II-digit industries as described in Appendix B.1.2. Concordance between trade and industry classifications according to Appendix B.1.1. CAGR: Compound Annual Growth Rate defined as $CAGR = (EV/BV)^{1/n} - 1$, where EV = ending value, BV = beginning value, n = number of year.

Data source: United Nations UN-COMTRADE (2020) database.

Figure B.6: Country-level export CAGR vs. sector share, ISIC Rev. 3 IV-digits, over time.

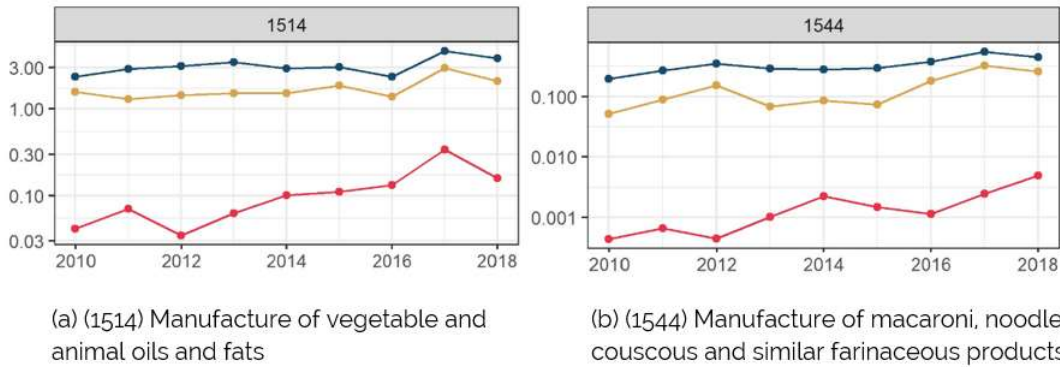


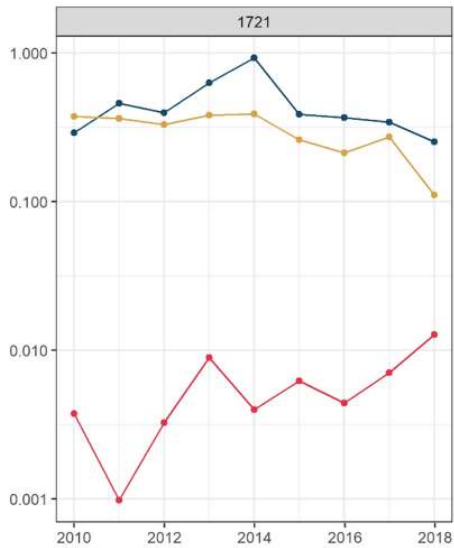
Note: ISIC Rev. 3 II-digit industries as described in Appendix B.1.2. Concordance between trade and industry classifications according to Appendix B.1.1. CAGR: Compound Annual Growth Rate defined as $CAGR = (EV - BV)^{1/n} - 1$, where EV = ending value, BV = beginning value, n = number of year.

Data source: United Nations UN-COMTRADE (2020) database.

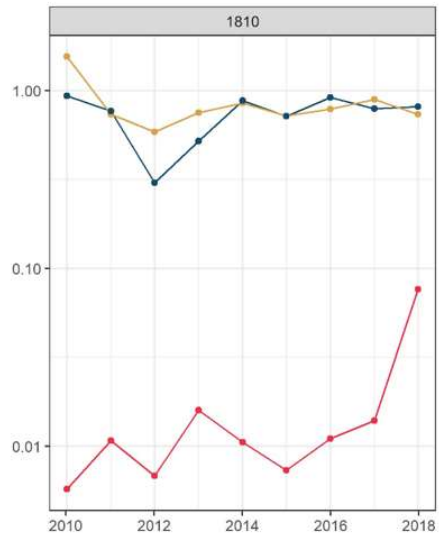
B.3 Supplementary Results Latent Untapped Potential (LUP)

Figure B.6: Guinea gross exports per capita, ISIC Rev. 3 4-digits, 2010-2018

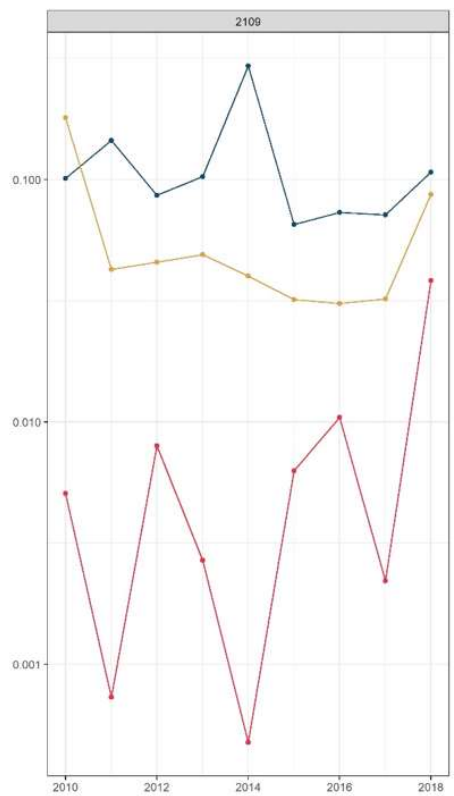




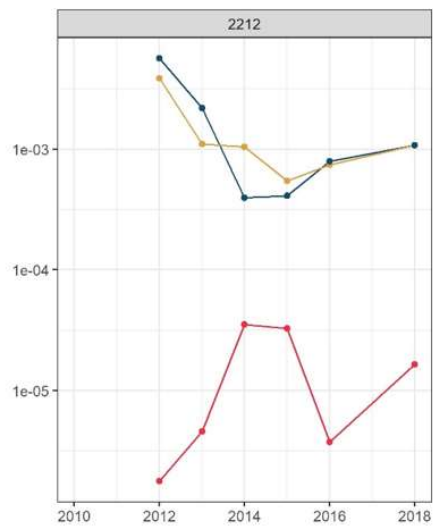
(c) (1721) Manufacture of made-up textile articles, except apparel



(d) (1810) Manufacture of wearing apparel, except fur apparel



(e) (2109) Manufacture of other articles of paper and paperboard



(f) (2212) Publishing of newspapers, journals and periodicals

—●— ECOWAS —●— Guinea mirrored —●— LI av.

Note: Guinea mirrored data. ISIC Rev. 3 2-digit industries as described in section B.1.2, year 2018. Concordance between trade and industry classifications according to section B.1.1. Indicators calculated as described in section B.1.3.

Source: United Nations Comtrade Database (UNSD).

B.4 Supplementary Results BOX 2.2: Trade Composition of sector (15) Food and Beverages and the potential of the agro-processing industry

Figure B.7: Guinea: Share of sub-sectors on total imports, 2018, ISIC Rev.3 IV-digit level.



Traded USD total economy by ISIC Rev. 3 II and IV-digit industry.
For a particular ISIC Rev. 3 IV-digit industry, shares corresponds to that sector's contribution to total exports (imports) of the country.

C Appendix to Section 3

This appendix provides additional information on Section 3: Bottlenecks to business. It further describes the underlying data from the World Bank Enterprise Surveys, lists the questions used and the way they are analyzed.

C.1. Data and methods

The most recent World Bank Enterprise Survey for Guinea was conducted in 2016. 27 manufacturing firms were interviewed. The distribution of firms across industries is reported in Table C.2. For the purpose of the analysis, the ECOWAS group was created as a benchmark by pooling together all members' observations. This also means that Nigeria, Ghana and Senegal might drive the results for the ECOWAS group due to the larger number of firms.

Table C.1. List of Benchmark countries

Country	Year of Survey	Manufacturing Observations
Benin	2016	80
Côte d'Ivoire	2009 and 2016	204 and 106
Gambia	2018	76
Ghana	2013	377
Guinea	2016	27
Liberia	2017	75
Mali	2016	99
Niger	2017	41
Nigeria	2014	1429
Senegal	14	249
Sierra Leone	2017	77
Togo	2016	45

Table C.2. Industry Distribution

ISIC Rev. 3.1	# of observations	ISIC Rev. 3.1	# of observations
2811	4	2022	2
1541	1	2412	1
1554	3	2423	1
3610	2	2424	2
2694	1	2429	1
2211	2	1810	1
2212	1	3190	1
2213	1	2221	3

Note: Number of observations by ISIC rev. 3.1 4-digit industries. *Data Source:* WB Enterprise Survey Guinea 2016.

C.1.1. World Bank Enterprise Survey

Tables that are based on the Enterprise Surveys show the results of different questions. Some are Yes/No questions, some are based on numbers, others are based on choosing an option out of a number of choices. Please refer to Table C.3 for the detailed list of questions from the Enterprise Surveys. The analysis is purely descriptive (e.g. counting firms that gave a specific answer) unless otherwise stated.

Survey questions are analyzed and presented in the following way: numbers in the tables show the share of firms that answered for example with 'Yes' or that gave a specific answer. Some numbers show the arithmetic mean if the question was answered with a number. The context can always be found in the text.

Since many questions can have multiple answers, numbers do not sum up to 1. Some answers, such as 'does not apply' or 'do not know' are not reported, another reasons for columns (or rows) not summing to one.

Shares not only refer to the given subgroup but are also restricted to firms that gave an answer at all. This means, '50 % of manufacturing firms' specifically refers to 50% of manufacturing firms that gave an answer.

The following shows all questions used in the analysis of Section 3. Please note, that while most questions are present in all surveys, some are exclusive to Guinea.

Table C.3. List of Survey Questions

Code	Description
a2	sampling region
a4a	industry sampling sector
a4b	industry screener sector
d1a2	main product (isic rev.3.1 4-digits)
a6b	size establishment categorical
b2a	What percentage of this firm is owned by private domestic individuals, companies or organizations?
b2b	What percentage of this firm is owned by private foreign individuals, companies or organizations?
b2c	What percentage of this firm is owned by government/state?
d3b	What percentage of sales were indirect exports?
d3c	What percentage of sales were direct exports?
k30	how much of an obstacle: access to finance?
g30a	how much of an obstacle: access to land?
j30c	how much of an obstacle: business licensing and permits?
j30f	how much of an obstacle: corruption?
h30	how much of an obstacle: courts?
i30	how much of an obstacle: crime, theft and disorder?
d30b	how much of an obstacle: customs and trade regulations?
c30a	how much of an obstacle: electricity to operations of this establishment?

l30b	how much of an obstacle: inadequately educated workforce?
e30	how much of an obstacle: practices of competitors in informal sector?
l30a	how much of an obstacle: labor regulations?
j30e	how much of an obstacle: political instability?
j30b	how much of an obstacle: tax administrations?
j30a	how much of an obstacle: tax rates?
c30b	how much of an obstacle: telecommunications to operations of this establishment?
d30a	how much of an obstacle: transport?
j5	in any of these inspections was a gift/informal payment requested?
j6	percent of the contract value paid as informal payments or gifts
j7a	percent of total annual sales paid in informal payments
j7b	total annual informal payment
c6	over last fy, did this establishment experience power outages?
c7	number of power outages experienced in a typical month in last fiscal year
c8a	average duration of power outages [hours; minutes]
c9a	in last fy, losses as % of annual sales due to power outages
c10	generator shared or owned over the course of last fiscal year?
c11	% electricity from generator owned/shared by the establishment in last fy
e11	does this establishment compete against unregistered or informal firms?
COVb2a	comparing this establishment's sales for the last completed month with the same
COVb2b	increased by how much, percent
COVb2c	decreased by how much, percent
COVc1	in the last month what was this establishment's output produced as a percentage
COVd0a	permanent, full-time workers end of december 2019
COVd1	permanent, full-time employees end of last month
COVe1a	liquidity or cash flow
COVe1b	sales on credit
COVe1c	purchases on credit
COVf1	has this establishment received any national or local government measures issued

C.1.2 Consultations

Consultations are interviews with local stakeholders such as interest groups, representatives from academia or the government. We first report our tentative findings and ask about the opinions of the respective interview partner. Further, the interview partner is encouraged to name topics that are viewed as obstacles that are not covered by the tentative findings. Summaries of their views are included in the text. If views from consultations contradict the findings from the World Enterprise Survey, evidence from other sources is taken into account in the final identification of the main bottlenecks.

D Appendix – UNIDO Guinea Firm-level Survey 2021

The **UNIDO Guinea Firm level Survey 2021** was conducted between January and April 2021 by UNIDO by means of an online questionnaire as well as in-person interviews the latter of which was coordinated by UNIDO's Guinea field office. The questionnaire contains at most 96 questions and was answered by a total of 40 establishments; see Table Z for a list of questions as well as corresponding responses by question. Out of these 40 establishments, 27, i.e. 67.5% of responses, were recorded for the manufacturing sector (see Table X). The manufacturing industries with the most responses are (15 + 16) *Fabrication de produits alimentaires et de boissons et tabac* with eleven responses followed by (24) *Fabrication de produits chimiques et de produits chimiques*, (25) *Fabrication de produits en caoutchouc et en plastique*, and (28) *Fabrication de produits métalliques, à l'exception des machines et équipements* with three responses each.

Table X

ANSWER CHOICES	RESPONSES	
Agriculture	7.50%	3
Mines	2.50%	1
Manufacture	67.50%	27
Construction	7.50%	3
Services	2.50%	1
Autre (veuillez préciser)	12.50%	5
TOTAL		40

Table Z

Summary of responses by question

Question	Answered	Skipped
Q1 - Forme juridique:	34	6
Q2 - Région du pays:	34	6
Q3 - Dénomination de l'entreprise:	33	7
Q4 - Nombre d'employés (nationaux et étrangers) :	30	10
Q5 - L'information financière:	22	18
Q6 - Capital:	25	15
Q7 - Informations complémentaires:	22	18
Q8 - Secteur d'activité :	40	0
Q9 - Secteur manufacturier:	23	17
Q10 - Comment les revenus ont-ils changé en raison du COVID par rapport à 2019?	30	10
Q11 - Comment l'emploi a-t-il changé à cause du COVID par rapport à 2019?	30	10

Summary of responses by question

Question	Answered	Skipped
Q12 - Quelle est la perspective commerciale pour 2021?	31	9
Q13 - Dans quelle mesure le développement du secteur privé dans le secteur manufacturier est-il un objectif clé pour que le pays gravisse les échelons du développement	29	11
Q14 - Dans quelle mesure le secteur privé manufacturier est-il impliqué dans la formulation de la politique industrielle?	29	11
Q15 - Quelles initiatives amélioreraient le processus de politique industrielle (stratégie industrielle et adoption d'instruments de politiques) pour promouvoir votre entreprise? (on peut cocher plus d'un cas)	29	11
Q16 - Votre pays a-t-il besoin d'une politique industrielle?	29	11
Q17 - Qu'est - ce que la nouvelle politique industrielle doit cibler? Pour chaque élément, veuillez commenter (élevé, modéré, pas relevant)?	29	11
Q18 - Au cours des 5 à 10 prochaines années, veuillez sélectionner les 5 industries manufacturières (en cochant correctement X) qui, selon vous, seront les plus importantes pour le développement du pays. Pour chacun des 5 secteurs sélectionnés, veuillez indiquer une seule raison correspondante pour laquelle vous pensez que le secteur sera si important.	27	13
Q19 - En dehors des industries manufacturières spécifiques, quels sujets pensez-vous être importants pour l'avenir de votre économie et qui vous apporteraient des opportunités spéciales? (Très important, important, moyennement important, peu important, non important)Qu'est-ce que l'Industrie 4.0?Industrie 4.0 fait référence à ces technologies numériques avancées qui concernent la réalisation d'usines intelligentes telles que l'intelligence artificielle, l'impression 3D, l'Internet des objets, etc. ou, si nous prenons en considération une définition plus large d'industrie 4.0, qui concernent formes plus élémentaires de digitalisation (email, computer etc.).	28	12
Q20 - Est- ce que votre entreprise adopte les technologies de l'industrie 4.0?	29	11
Q21 - Qu'est-ce qui empêche votre entreprise d'adopter ou d'adopter partiellement la technologie de l'Industrie 4.0? (très grave, majeur, modéré, mineur, aucun obstacle)	25	15
Q22 - Est - ce que votre entreprise participe-t-elle à des activités d'économie circulaire?	29	11
Q23 - Quelle est la raison principale pour laquelle votre entreprise ne participe pas ou ne participe pas partiellement	22	18

Summary of responses by question

Question	Answered	Skipped
aux activités de l'économie circulaire? (très grave, majeur, modéré, mineur, aucun obstacle)		
Q24 - Est – ce que votre entreprise fait-elle partie des chaînes de valeurs mondiales du secteur manufacturier?	28	12
Q25 - Quelle est la principale raison pour laquelle votre entreprise ne s'intègre pas ou s'intègre seulement partiellement dans les chaînes de valeur mondiales? (très grave, majeur, modéré, mineur, aucun obstacle)	19	21
Q26 - Votre entreprise a-t-elle investi dans un parc industriel ou des zones économiques spéciales?	27	13
Q27 - De quoi votre entreprise aurait-elle besoin pour déménager ou déménager partiellement dans un parc industriel ou une zone économique spéciale? (très grave, majeur, modéré, mineur, aucun obstacle)	22	18
Q28 - L'accès au financement est-il un goulot d'étranglement pour votre entreprise?	32	8
Q29 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement...136	20	20
Q30 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...141	20	20
Q31 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...142	21	19
Q32 - L'accès à la terre est-il un goulot d'étranglement pour votre entreprise?	32	8
Q33 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement...144	13	27
Q34 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...150	14	26
Q35 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...151	14	26
Q36 - L'accès à une Zone Industrielle est-il un goulot d'étranglement pour votre entreprise?	32	8
Q37 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement...153	13	27
Q38 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...159	13	27

Summary of responses by question

Question	Answered	Skipped
Q39 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...160	13	27
Q40 - Les licences et permis commerciaux constituent-ils un goulot d'étranglement pour votre entreprise?	31	9
Q41 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....162	7	33
Q42 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...167	7	33
Q43 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...168	7	33
Q44 - La corruption est-elle un goulot d'étranglement pour votre entreprise?	29	11
Q45 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....170	18	22
Q46 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...175	18	22
Q47 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...176	19	21
Q48 - La justice est-elle un goulot d'étranglement pour votre entreprise?	28	12
Q49 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....178	12	28
Q50 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...182	11	29
Q51 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...183	12	28
Q52 - L'insécurité est-elle un goulot d'étranglement pour votre entreprise?	28	12
Q53 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....185	15	25
Q54 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...189	15	25
Q55 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...190	15	25

Summary of responses by question

Question	Answered	Skipped
Q56 - Les douanes sont-elles un goulot d'étranglement pour votre entreprise?	28	12
Q57 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....192	14	26
Q58 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...197	14	26
Q59 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...198	14	26
Q60 - L'électricité est-elle un goulot d'étranglement pour votre entreprise?	28	12
Q61 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....200	13	27
Q62 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...204	13	27
Q63 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...205	13	27
Q64 - Les qualifications du personnel sont-elles un goulot d'étranglement pour votre entreprise?	27	13
Q65 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....207	14	26
Q66 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...211	14	26
Q67 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...212	14	26
Q68 - Le secteur informel est-il un goulot d'étranglement pour votre entreprise?	27	13
Q69 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement[a].	13	27
Q70 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement[b].	0	40
Q71 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...219	13	27
Q72 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...220	13	27

Summary of responses by question

Question	Answered	Skipped
Q73 - La réglementation du travail est-elle un goulot d'étranglement pour votre entreprise?	27	13
Q74 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....222	6	34
Q75 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...226	6	34
Q76 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...227	6	34
Q77 - Le mouvement socio-politique est-elle un goulot d'étranglement pour votre entreprise?	27	13
Q78 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....229	17	23
Q79 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...232	17	23
Q80 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...233	17	23
Q81 - L'administration fiscale est-elle un goulot d'étranglement pour votre entreprise?	27	13
Q82 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....235	13	27
Q83 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...238	13	27
Q84 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...239	13	27
Q85 - Le taux d'imposition est-il un goulot d'étranglement pour votre entreprise?	27	13
Q86 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....241	13	27
Q87 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...245	13	27
Q88 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...246	13	27
Q89 - Les télécommunications sont-elles un goulot d'étranglement pour votre entreprise?	27	13

Summary of responses by question

Question	Answered	Skipped
Q90 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....248	12	28
Q91 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...252	12	28
Q92 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...253	12	28
Q93 - Le transport est-il un goulot d'étranglement pour votre entreprise?	26	14
Q94 - Veuillez noter ci-dessous la gravité des causes potentielles de ce goulot d'étranglement....255	16	24
Q95 - Pour ce goulot d'étranglement voyez-vous des améliorations ou des détériorations au fil du temps dans les dernières 3 années?...259	16	24
Q96 - Pour ce goulot d'étranglement envisagez-vous des améliorations ou des détériorations au fil du temps dans le prochaines 3 années?...260	16	24

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- ⁱ Guinea Vision 2040
- ⁱⁱ World Bank 2018, Guinea Systematic Country Diagnosis
- ⁱⁱⁱ Ministère du Plan et du Développement Économique 2016 , Plan National de Développement Economique et Social (PNDES) 2016-2020
- ^{iv} Ministère Des Mines Et de La Géologie www.mines.gov.gn
- ^v Ministère du Plan et du Développement Économique 2016, Plan National de Développement Economique et Social (PNDES) 2016-2020
- ^{vi} World Bank - IFC 2020, Guinea Private sector diagnosis
- ^{vii} Widder et al 2019, Sustainably Growing Guineas Bauite aluminium industry
- ^{viii} World Bank 2020, Structural Change and Productivity Growth in Guinea
- ^{ix} Institut National De La Statistique (INS) Annuaire 2019
- ^x African Development Bank 2020 African Economic Outlook 2020
- ^{xi} World Bank 2018, Guinea Systematic Country Diagnosis
- ^{xii} Ministère du Plan et du Développement Économique 2019, Rapport Annuel De Performance 2019
- ^{xiii} Ministère du Plan et du Développement Économique 2016, Plan National de Développement Economique et Social (PNDES) 2016-2020
- ^{xiv} World Bank 2018, Guinea Systematic Country Diagnosis
- ^{xv} ECOWAS 2010, West African Common Industrial Policy
- ^{xvi} World Bank 2020, Structural Change and Productivity Growth in Guinea
- ^{xvii} UNCTAD 2011, Economic Development in Africa Report 2011:Fostering industrial development in Africa in the new global environment
- ^{xviii} World Bank 2018, Guinea Systematic Country Diagnosis
- ^{xix} Ministère de l'Industrie et des Petites et Moyennes Entreprises, Presentation Du Fonds De Developpement Industriel Et Des Pme
- ^{xx} UNIDO Cadre De Programmation Pays Pour Un Developpement Industriel Inclusif Et Durable – Cycle 2020-2023
- ^{xxi} Délégation de l'Union Européenne en Guinée 2020, Rapport Final De L'elaboration Du Document De Politique Commerciale De La Republique De Guinee
- ^{xxii} Ministère De L'industrie Et Des Petites Et Moyennes Entreprises 2018, Annuaire Statistique 2018 De L'industrie Et Des Pme
- ^{xxiii} Ministère du Plan et du Développement Économique 2016, Plan National de Développement Economique et Social (PNDES) 2016-2020
- ^{xxiv} World Bank 2018, Guinea Systematic Country Diagnosis
- ^{xxv} Institut National De La Statistique (INS) Annuaire 2019
- ^{xxvi} African Development Bank 2020 African Economic Outlook 2020
- ^{xxvii} World Bank - IFC 2020, Guinea Private sector diagnosis
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