Leiden University

Department of Humanities

International Relations - Global Political Economy

**Master Thesis**

Julius Tschernig

Supervisor: Dr. Saori Shibata

# Profiting from Bauxite? – Obstacles and Implications for Guinea

# Table of Content

# List of Figures

# 1. Introduction

Despite its large raw material deposits and hydropower potential, Guinea is one of the poorest countries in the world. It has large mineral deposits of gold, diamonds, gemstones, nickel, copper and other minerals, as well as the world's largest reserves of iron ore and bauxite. In fact, Guinea has about one-third of the world's bauxite reserves (Ministère des Mines et de la Géologie, 2016). While Guinea has lagged behind other countries such as Australia, India, China and Brazil in bauxite production, this changed with a recent investment by SMB (Société Minière de Boké), a Chinese company owned, among others, by aluminum giant China Hongqiao (OECD, 2019). As China aims to strengthen its market position in the production of aluminum intermediates, known as "semis", its investments in Guinea have surged in recent years (OECD, 2019). In addition, several major rivers originate in Guinea, such as Niger, Senegal, and Gambia, giving the country a potential hydropower output of 6,000 megawatts (Lanciné and Mijiyawa, 2020). This large hydroelectric potential could be used for the development of alumina refineries, as the refining process is very energy intensive and therefore, requires a constant and cheap energy supply. Thus, on paper Guinea even has good conditions for strong economic development based on investment of mining revenues. However, despite these positive conditions, the economic reality is quite different.

Guinea's economy is struggling and the country lags behind almost all economic and political development standards. With a Human Development Index (HDI) score of 0.466, it ranks 174th out of 189 countries. The HDI measures various statistical composites, such as income indicators, education, or life expectancy, to rank countries in human development (UNDP, 2019). In the Ease of Doing Business Index of the World Bank (2019) Guinea is ranked 156 from 190 countries. Although growth in Guinea is stable at 6%, the country faces high inflation and rising poverty, which increased from 41.9% in 2002 to 55.2% in 2012 (AFDB, 2020). Furthermore, Guinea has with 940 USD the 22nd lowest Gross National Income (GNI) per capita (Atlas Method) in the world (World Bank, 2020a). Guinea is in great need of investments in human capital and infrastructure. Moreover, contributions towards a structural change of the economy declined over the last years (Lanciné and Mijiyawa, 2020). More than 50% of Guinea's working population is employed in the agricultural sector, which provides income to about 57% of rural households (World Bank, 2020b). On the political side, Guinea faces major challenges. Although the political climate in Guinea has improved in recent years, relations

between the government, the political opposition, and the public remain fragmented and acrimonious. Political disputes have centered on elections, which, while not necessarily rigged, have a history of high irregularities. Additionally, the country struggles with endemic corruption (BTI, 2019). Guinea is a very fragile country ranking 12th among the world most fragile countries in 2016 (IMF, 2017). As a result, violence erupted again in 2020 following Guinea's presidential elections. Nearly 2 dozen people were killed following the highly contested election (Aljazeera, 2020).

Moreover, Guinea's economy is not very diversified. The manufacturing and service sectors are playing a smaller role, while its economy is strongly dependent on mining and especially bauxite mining, accounting for 34% of Guinea's exports in 2018 (International Trade Administration, 2019). The mining sector contributed 21.6% to Guinea's GDP and 90% to its exports in 2012 (KPMG, 2014). In addition, Guinea shows high inter-sectoral productivity gaps, for example, mining being the most productive sector with a share of total employment of only around 0.71%, while the agricultural sector has by far the lowest labor productivity, but employs more than half the people (Lanciné and Mijiyawa, 2020). Currently, there are fifteen bauxite mining operations in Guinea, most of which have only started recently. In fact, the bauxite production almost tripled from 2014 to 2018, showing the tremendous increase in mostly Chinese investments in Guinea (Pacioni, Widder and Bocoum, 2020). The Guinean government sees mining as the essential drive for economic growth and is trying to attract more foreign direct investment in mining but also more diversified investments in this sector. To do so, the government is planning on doubling its hydroelectric power in the next seven years in order to attract investment in refineries. Nevertheless, it failed to increase its potential significantly in the last years, since it only increased its hydroelectric potential from 4% in 2004 to 11% in 2019 (Bavier, 2019).

In the past Guinea made already some steps towards improving the mining sector and earning more out of its natural resources. Right after the election in 2010, Alpha Condé, the current president, implemented a new mining code, which was signed in 2011. This mining code should improve social, environmental and accountability mechanisms by establishing strict requirements, such as corporate social responsibility standards and anti-corruption measures (Natural Resource Governance Institute, 2016). While the strict anti-corruption requirements are no guarantee that corruption has been rolled back, they were an indicator that Guinea was ready to address the problems, which prevented the country from benefiting more from its

gigantic natural resources. However, private transnational companies in the aluminum sector heavily opposed the new mining code as they would have to pay significantly more taxes and royalties. Therefore, they build up high pressure on the government to rework the mining code by freezing large investments. At the end, this led to a weakening of the mining code through additional amendments in 2013 (Natural Resource Governance Institute, 2016). Furthermore, some companies like the Russian owned CBK (Compagnie des Bauxites de Kindia) made special agreements with the Guinean government to bypass the new mining code. CBK even got a renewal and extension of its mining concession under the old terms until 2050 (Maclean, 2019).

The implementation of a new mining law shows that Guinea had the will to transform its mining sector to make more profit and move it in a more sustainable direction. However, the quick and very indignant reaction of the aluminum industry, which led to an almost immediate backtracking by the government, raises questions about the balance of power between the Guinean government and the international aluminum companies.

According to the so-called “resource curse theory”, corruption, rent-seeking, or economic mismanagement are often the explanations, for why a country has poor socioeconomic development despite having significant resource reserves (Ross, 1999). Certainly, these are problems that affect the Guinean economy, but these problems are not the only factors limiting Guinea's potential. While the World Bank (Lanciné and Mijiyawa, 2020) argues that greater structural transformation towards a diversified economy and more investment in human capital and infrastructure are the main keys to improving Guinea's development, Knierzinger (2014, pp. 25–26) argues that the unwarranted unequal balance of control between the mining companies and the government is the driving force behind Guinea's economic problems, as the mining companies prevent diversification of Guinea's aluminum industry, the key to Guinea's revenues and main driver of the economy. Furthermore, he criticizes that the mining companies have extensive leverage over the government not only due to the high market dominance resulting out of the so-called “vertical integration” (a company owns it suppliers and distributors) in the aluminum value chain, but also due to the way of operation in the country, for example, fostering infrastructural power and leverage. According to Readhead (2016), significant tax evasion by mining companies and mispricing of transactions within a multinational company prevent fair resource rents for Guinea.

All of this evidence suggests that Guinea may be able to profit much more from its natural resources than it currently does. In turn, more profits for Guinea would mean that the country could invest more in underdeveloped sectors of the economy and human capital to promote its growth and development. Since it is not at all clear, what is preventing the country from unleashing its enormous economic potential, more research in this direction is needed. It turns out, however, that in contrary to the prevailing assumption of the resource curse theory, the main problem is not the Guinean government or, more specifically, corruption, poor economic decisions, or rent-seeking, but a combination of external factors. Therefore, the following research question arises: What factors are limiting Guinea's ability to extract more profit from its bauxite reserves?

This thesis examines potential constraints for Guinea arising from the aluminum value chain, as well as those, arising directly from bauxite operations in Guinea. First, the resource curse theory as an important explanatory base is introduced, and its strengths and weaknesses are explained. Based on those strengths and weaknesses, the research design is developed and explained in detail. This is followed by the case study on Guinea, which consists of two parts. The first part analyzes the obstacles arising from the aluminum value chain, whereas the second part deals with the obstacles arising from the bauxite operation directly in Guinea. For this purpose, the operations of three major bauxite companies in Guinea were studied in detail: CBG (Compagnie des Bauxite des Guinée), headquartered in the USA, Great Britain and the Channel Islands as well as the already mentioned companies SMB, headquartered in China and CBK, headquartered in Russia.

## 2. Literature Review

While the resource curse theory gives interesting thoughts and approaches about the problems that usually accompany developing countries with their natural resources, it is by no means mature and shows many weaknesses and gaps. Nevertheless, the resource curse theory is a good start into the matter and might have great potential to provide solutions to such problems in the future, if its gaps can be filled and its weaknesses can be corrected. In this chapter, the theory of the resource curse is first introduced. After that, the main causes of such a curse, mentioned in the debate about the theory, will be identified. This is followed by a summary of various criticisms of previous findings and methods. Finally, the results of this literature review are summarized and their relevance to this thesis is explained.

## 2.1 The Resource Curse

While many countries could grow and develop successfully on the exploitation of natural resources, for example, Norway, the United States, Australia or Canada, other resource-rich countries, for example, Nigeria, Venezuela or Guinea, failed to do so. In addition, a variety of resource-poor countries managed to pull of economical miracles, for example, Japan, Singapore, or South Korea, showing that natural resources are neither necessary nor enough for economic development (Badeeb, Lean and Clark, 2017).

The phenomenon of countries with extensive natural resources growing slower than countries without such resources is called "resource curse". Emerging in the end of the 20th century the resource curse theory rose interest among academic scholars, but also influenced policy circles (Papyrakis, 2017). While the term "resource curse" was coined by Richard Auty (1994), the idea of a potential negative impact of mineral-based development can be traced back to the work of Prebisch (1962) and Singer (1950). According to Ross (2015; p.240), the resource curse can be defined as "(…) the adverse effects of a country's natural resource wealth on its economic, social or political well-being."

Having a closer look on the term "natural resource" is very important, as there are many possibilities of interpretation. Some researches distinguish between point resources (e.g. extractives) and diffuse resources (e.g. agriculture), others differentiate between particular commodities (e.g. oil, minerals, agricultural crops) and, for example, abundance of land (Ross, 2015; Papyrakis, 2017). In addition, it is very important to clarify the key measures of natural resources: resource dependence and resource abundance. While resource dependence refers to the degree of the importance of a natural resource to a country, resource abundance refers to the available amount of a natural resource (Brunnschweiler and Bulte, 2008). As Badeeb, Lean and Clark (2017) are criticizing, the two measures have been used as misleading synonyms in several studies, highlighting the different measurement methods for the two terms. Sachs and Warner (1995, 1999, 2001) demonstrate a possible negative relation between resource dependence and economic growth with cross-sectional studies and large data sets. While this took the attention to negative impacts on economic growth, many studies focus on the negative impacts of natural resources on long term growth, trying to provide explanations.

## 2.2 Main Explanations for the Resource Curse

According to Ross (1999), most of the explanations for the resource curse are centered around mismanagement and failure of the state or a state-owned institution. Other explanations are market instability and changing commodity prices, as well as macroeconomic effects, like the Dutch disease (Ross, 1999; Badeeb, Lean and Clark, 2017). While some scholars argued that resource abundance relates to debt overhang (countries using their natural resources as a collateral), others argued resource abundance leads to less human capital investment due to a very low need for human capital in the extractive industry (Gylfason, 2001; Manzano and Rigobon, 2001; Papyrakis and Gerlagh, 2004; Sarr *et al.*, 2011). In recent years, institutional explanations have attracted scholars' attention. The idea behind this explanation is that the quality of public sector institutions influences economic growth. For example, the more rent-seeking or patronage exists in a country, the lower is the economic growth of such a resource abundant country (Mehlum, Moene and Torvik, 2006; Robinson, Torvik and Verdier, 2006). However, the role of public sector institutions is controversial: some scholars treat such institutions as a dependent variable, while others view them as a mediating variable. Several studies suggest that resource rents may encourage corruption and have a negative impact on the quality of institutions (Isham *et al.*, 2005; Arezki and Brückner, 2011; Eregha and Mesagan, 2016). However, other studies argue that the quality of institutions has an impact, whether resource abundance will have positive or negative effects (Mavrotas, Murshed and Torres, 2011; El Anshasy and Katsaiti, 2013; Sarmidi, Hook Law and Jafari, 2014). In addition, there are multiple scholars arguing against a universal existence of a resource curse. For example, Brunnschweiler and Bulte (2008) question the use of resource dependence as an appropriate exogenous variable in regression analysis, arguing that poor institutional quality makes it unlikely that a country will develop a non-primary productive sector and, therefore, causality would lead from institutions to resource dependence. Cavalcanti, Mohaddes and Raissi (2011) also disagree with the existence of a resource curse and argue that it is instead a blessing. Gilberthorpe and Papyrakis (2015) note that there is a fragmentation on three levels (macro, meso and micro) in the literature around the resource curse. On each of the levels research of particular disciplinaries is dominant. For example, economists and political scientists are focusing mostly on the impacts of resource abundance on long term growth on the macro and meso level, while sociologists and anthropologists are primarily focusing on the development impacts of the extractive industry on local communities and, therefore, on the micro level (Gilberthorpe and Papyrakis, 2015). While the resource curse thesis itself is controversial, the main explanations for its occurrence are found to be state-centered around rent-seeking of the

actions of the affected state or its public service institutions. However, no explanation has yet been developed that is accepted in the literature. This could be due to the fragmentation of research on the one hand, and it is quite possible that important explanatory factors have been overlooked on the other.

## 2.3 Criticism

During two decades of interdisciplinary research and academic debate, it became clear that the phenomenon of the resource curse is way more complex. In addition, several researchers expressed important criticisms of the results obtained to date and the methods used to obtain them. With the diversification of the literature and the studies on the resource curse more studies came to the result that resources could harm the socioeconomic development instead of only economic growth (Papyrakis, 2017). The problem with the hypothesis regarding the resource curse is that they are extremely difficult to prove and to research, since it is impossible to compare a country with itself in one situation with natural resources and in another without. Furthermore, economic growth as well as socioeconomic development is influenced by a vast number of variables. In addition, the drivers of economic growth and socioeconomic development can differ drastically from country to country, so any hypothesis on correlation or non-correlation is difficult to falsify (Stevens, Lahn and Kooroshy, 2015).

Most studies are based on quantitative analysis of large panel data sets with a single observation or are based on cross-sectional methods (Ross, 2015; Savoia and Sen, 2020). Furthermore, Ross (2015) points out that the results are not reliable due to the poor quality of the available data. It is very difficult to assess the effects of resources on key factors of economic growth. Especially the extractive industry is very opaque. Even though there has been development towards more transparency, the extractive industry still lags behind compared to other sectors. It has to be noted as well that most of the countries appearing in the resource curse research are unstable and poor countries with high corruption and autocratic regimes. The quality of statistical data released from such governments is questionable. In addition, Van der Ploeg and Poelhekke (2017) argue that older cross-country evidence should not be heavily relied on, since there are many methodological problems, like omitted variable bias or multicollinearity. They argue that the use of data from recent resource discoveries, natural experiments as well as within-country studies, and the focus on local impacts of the extractive industry can produce better identification strategies and better estimates. Moreover, there is the question on how to assess economic growth or socioeconomic development correctly. For example, taking GDP as a

growth indicator and mineral rents as percentage of GDP, can be quite problematic, if countries have a large informal economy and are prone to corruption.

According to further criticism, it is not enough to show a link between dependence on natural resources and poor economic growth or socioeconomic development. Rather, it is important to explain the mechanisms behind this phenomenon. While the focus was lying on mechanisms of the resource curse on economic growth, Savoia and Sen (2020) argue for more research on different development outcomes. This goes along with Ross (2015), arguing that researchers should focus on the consequences of natural resources to a country. In addition, Stevens, Lahn and Kooroshy (2015) argue that many logical questions and mistakes in methodology could be prevented with a new focus on the reasons, why resource production has failed to produce more stable economies. Subnational research can also help to identify, whether political factors, such as rent-seeking or corruption, are endemic or caused or enforced by natural resources (Badeeb, Lean and Clark, 2017). Due to the weaknesses of cross-sectional and panel studies, there is a slow trend towards more within/subnational country studies, as they provide multiple advantages, such as providing better data and more convincing identification strategies (Ross, 2015).

Another problem with researching is the dominant focus on a few resources. The vast majority of studies on the resource curse focus on oil, due to the direct impact of oil prices on the global economy and financial markets (Gilberthorpe and Rajak, 2017). However, the effects and unique mechanisms of individual resources are mostly overlooked. While some resources are similar, others differ drastically in the way they are traded and used but also in their occurrence around the world. For example, most scholars see large resource rents for the government as given. However, they overlook that the resource rents can vary strongly from mineral to mineral. While oil, for example, can be sold relatively easy on the world market to market prices, this is not the case for bauxite (OECD, 2019). According to Ross (2015), researching the differences in mechanisms, outcome or conditions between different minerals are absolutely necessary in order to get a complete picture. In order to be able to understand possible effects of resources on the socioeconomic development of a country, it is tremendously important to understand the nature of the business of the particular resource.

Furthermore, it is extremely important to research the relations between the different stakeholders. For example, Gilberthorpe and Rajak (2017) criticize the abstraction of social and

power relations in analysis around the resource curse, arguing that those relations are characteristically for the extractive industry and, therefore, need increased attention. A qualitative approach can take social, economic, power and political relations in account, thereby offering an additional viewing angle. Furthermore, a qualitative study is less constraint by poor quality statistical data and problematic variables to assess economic growth or development. While a variety of studies on the resource curse are focusing on the social and power relations between extractive companies and local communities (micro level), there are only a few that focus on the relations between mining companies and governments (macro level), hence, much more research in this direction is needed.

The above criticism highlights the many sources of error that must be considered and avoided, when conducting research in this area. In addition, it becomes clear, which explanatory factors are important and should be investigated. This is now explained more in detail in the following.

## 2.4 Research Design and Method

It must be acknowledged that the resource curse theory, in its current state, does not provide sufficient explanations to fully understand the resource curse phenomenon or to find solutions to the problem. However, the debate surrounding the resource curse theory is particularly useful for this case study on Guinea. While the identified explanations certainly play an important role in showing that some countries are struggling to grow their natural resources, the widespread criticism clearly shows that these explanations only scratch the surface. It seems that the dominant focus of quantitative and economically oriented research has fostered a one-sided research focus. However, new questions, methods, and foci could add more substance to the theory and spark new debates. In summary, although the theory of the resource curse has some weaknesses and gaps as described, these can be overcome through the means outlined above. This being said, the prevailing opinion within the resource curse theory debate is not particularly informative for the case of Guinea. However, the critique of the resource curse theory provides a good research framework to avoid many sources of error, while filling gaps in the resource curse theory. For example, the dominant approach of quantitative research was found to have some weaknesses, but these can be overcome by a qualitative approach. The critique of the resource curse theory also leads to the research question focus of the obstacles that prevent Guinea from benefiting more from its bauxite wealth. This has several advantages. First, a major source of error, namely the definition and measurement of economic impact, can be avoided. Second, the research question examines important gaps in the resource curse theory.

Thus, this study contributes to improving the resource curse theory by focusing on a rarely considered resource (bauxite) and shedding light on the mechanisms that arise from the nature of the bauxite business and its importance to the aluminum value chain. This is particularly important, as the nature of the business with certain minerals could invoke conditions that reduce the prospects for socioeconomic development based on this resource. Furthermore, focusing on the importance of the nature of the business of certain minerals, such as bauxite, could be an important step in bridging research at different levels (macro, meso, and micro), as identified by Gilberthorpe and Papyrakis (2015).

Based on these results, the research design of this paper becomes clear. The mechanisms behind the aluminum value chain, bauxite mining, and its importance to Guinea are examined through a qualitative secondary analysis. Guinea, therefore, is an excellent case, because on the one hand bauxite is the most important natural resource for its economy, but on the other hand the economic development of the country is rather below average compared to other countries in this region. Furthermore, such a country study could provide a much better identification strategy regarding the resource curse theory (Ross, 2015). The case study focuses on the obstacles that prevent Guinea from exploiting its bauxite resources more profitably. Therefore, it analyzes the general problems arising from the organization and operation within the aluminum value chain, and after that also examines the problems that occur directly for Guinea with regard to the bauxite business.

As mentioned in the critique of the resource curse theory, the mechanisms behind the natural resource (bauxite) need to be investigated. Thus, the main characteristics of the aluminum value chain, vertical integration and governmental support of the home countries of the transnational bauxite corporations, were analyzed under 3.1 of the case study. Since especially the issue of governmental support seemed to have direct implications on the situation in Guinea, the extent and implications of foreign governmental influence on the Guinean bauxite business is analyzed among the following hereafter in 3.2. According to Gilberthorpe and Rajak (2017), it is very important to analyze the social and power relations of the different stakeholders, so the relationships between local communities and mining companies are examined. Two important issues that influence the relationship between mining companies and the local population are salaries and working conditions on the one hand, and compensation for expropriation on the other. In addition, the power relations between the Guinean government and the mining companies regarding its leverage will be analyzed in detail, as this aspect has been rather

neglected in the resource curse debate. Finally, the framework of the bauxite trade in Guinea is examined for obstacles, as this generates a part of the turnover and profit for the mining companies, which serve the Guinean government as an indicator for royalties and taxes. Since an analysis of all bauxite mining operations in Guinea is beyond the scope of this paper, the three already mentioned major operations CBG, SMB and CBK were selected, based on their size, duration and importance to the global aluminum market as well as their impact on Guinea. Furthermore, these three operations provide a good insight into the different approaches of companies with different cultural backgrounds. Thus, this work should provide a representative insight into the aluminum value chain and bauxite operations in Guinea.

The research for this case study was based on desk research, which included a literature review of academic literature, but also news outlets, official documents and websites, e.g. from non-profit organizations or companies active in the aluminum/bauxite business. Due to the frequent unavailability of accurate primary data on the activities of mining companies in Guinea and the general lack of transparency in the sector, the study followed a qualitative secondary analysis of data. This allowed a broader perspective on the issue and more time for data analysis. The reanalysis in conjunction with other secondary data led to new interpretations. However, it must be acknowledged that the quality of the data is often poor. This is due to the lack of transparency of the extraction industry as a whole, but also to the lack of transparency of the Guinean government and its poor institutional quality. Nevertheless, the combination of different data sources allowed a comprehensive analysis on the topic.

With this framework and focus, this work could help filling important research gaps within the resource curse theory. Nevertheless, it is important to mention that confirming or falsifying the resource curse theory is not the goal of this work and cannot be achieved within the scope of this thesis. Rather, the goal of this case study is to shed light on Guinea's case and to use the findings to spark new debates within resource curse theory and improve it further.

# 3. Case Study on the Aluminum Value Chain and the Bauxite Business in Guinea

The first part of this case study will present the aluminum value chain and explain the resulting two main obstacles for Guinea: the problems resulting out of the vertical integration and the strong interests of foreign governments in the aluminum industry. The second part of this chapter will focus on the obstacles directly encountered in the mining of bauxite in Guinea, thus, preventing Guinea from exploiting its bauxite resources more profitably.

## 3.1 The Aluminum Value Chain

Broken down, the aluminum business can be displayed with four simple steps: mining[1], refining[2], smelting[3] and semi-production[4].

The aluminum value chain is structured in the upstream segment, meaning bauxite mining and refining, the midstream segment, as there is the primary aluminum production and recycling, and the upstream production, which means semi-fabricated aluminum production (hereinafter referred to as "semis") and its use in manufacturing (OECD, 2019). All steps within the process of the aluminum production are very capital intensive. Therefore, the supply chain is producer driven and trumpet shaped, in contrast to, for example, the garment industry, which is buyer driven and shaped like a pyramid, making it easy to replace single suppliers. In a trumpet shaped

[1] Normally bauxite occurs very close to the surface in a depth of one to two meters and has a range of thickness of three to five meters. Also, there are different qualities of bauxite: bauxite that needs dry or wet beneficiation and bauxite that does not need any further treatment. Usually a bauxite mine employs 500 to 1000 workers (Donoghue, Frisch and Olney, 2014). Most bauxite reserves are located in Guinea, Australia, Brazil, Vietnam, India, China and Jamaica. Even though there are bauxite reserves in Europe as well, they are either exhausted or too expensive to exploit (Kerkow, Martens and Müller, 2012, p. 27).

[2] In the second step the bauxite will be refined in a refinery into alumina. Depending on the quality of the bauxite, between two and three tons of bauxite are needed in order to produce one ton of alumina (Aluminum for Future Generations, 2018). Most alumina in the world is refined with the so-called "Bayer Process", as it is the most economical way of refining. The final product after refining is a white powder that can be used in the chemical industry or smelted in aluminum. Around 90% of alumina will be used for the aluminum production (Aluminum for Future Generations, 2018). Furthermore, the refining process is very energy intensive (Kvande, 2014).

[3] In the third step the alumina will be transported to a smelter to smelt it with the Hall-Héroult process in primary aluminum. Again, for every ton of aluminum two tons of alumina are needed, so for one ton of primary aluminum four to six tons of bauxite are needed. As the refining process the smelting process is again very energy intensive. In total the energy costs make up to 20-40% of the costs of producing aluminum (The Aluminum Association, 2020a). Moreover, there is the possibility to recycle aluminum to secondary aluminum. This process needs around 90% less energy than the production of new aluminum (The Aluminum Association, 2020b).

[4] The fourth and last step of the aluminum value chain is the production of semi-fabricated aluminum products, so-called "semis", being used in the manufacturing process. Most semis will be used in packaging, construction and in the transport sector (Australian Aluminum Council, 2020).

value chain every production and processing facility is dependent on the production, bauxite mining, alumina production and aluminum smelting. If one of it stops, this has very severe consequences on all following mid and downstream facilities (Knierzinger, 2016, pp. 139–140). It is important to notice that for reasons of a producer driven value chain theoretically bauxite mine workers (when properly organized) should have a considerable leverage not only against the government of the country, where the mine is located, but also against international mining corporations. Furthermore, because the Guinean government is controlling the licensing and the framework for the extraction, it should have a great leverage against mining companies as well. However, this is not the case for Guinea. In fact, Knierzinger (2018) observed that Guinean bauxite workers and the Guinean government have a very low leverage against the operating mining companies. Therefore, it can be concluded that other factors within the aluminum value chain must be responsible for the low leverage of the bauxite workers and the Guinean government. As noted during the case study, and as will be explained in detail later, two major obstacles arise for Guinea from the mechanisms behind the aluminum value chain. The first is the complete control of the major aluminum companies over every asset and every production step from mining to the production of semi-finished products, which is referred to as “vertical integration”. And the second obstacle is the great governmental support of foreign states for their aluminum companies that results in strong involvement of foreign state interests. In the following, those obstacles resulting out of the aluminum value chain will be further explained.

*Figure 1: Bauxite - Residual product of chemical wheatering from rocks containing aluminum silicates (Norsk Hydro, 2020b).*

*Figure 2: Alumina - Aluminumoxid: Raw Material for the production of primary aluminum (Norsk Hydro, 2020a).*

*Figure 3: Cast products - Semi-fabricated products out of primary aluminum (ALCOA, 2020b).*

### 3.1.1 Vertical Integration

Vertical integration means that a company controls or owns its suppliers, distributors or retailers in order to control all processes of production (Cambridge Dicitionary, 2014). It is important to acknowledge that with increased vertical integration the business of a company gets more difficult due to the high differences between the production steps. Therefore, vertical integration needs to give companies in the aluminum sector a significant advantage to make those efforts worthwile. According to Knierzinger (2016, p. 140), the centered occurrence of bauxite in only a few places together with the need of great technical knowledge and the very capital intensive nature of the business, result in a very interconnected and interdependent business structure. Therefore, there are only a few transnational companies in the aluminum value chain, which are able to operate smelters, refineries as well as bauxite mines in different parts of the world. However, not all of the major companies are active in the whole value chain reaching from mining to the production of semis. Vertical integration in the upstream segment

guarantees lower production costs, leading to a much better cost efficiency. In addition, vertical integration in large smelters offers economies of scale, while the development of new smelter infrastructure can have a major impact on long-term competitiveness (United States International Trade Commission, 2017, p. 105). Moreover, it is granting the companies sufficient long-term access to bauxite and alumina. However, it makes them less exposed to price changes for bauxite. If they have a third party bauxite business, they can store bauxite, when prices are low and sell bauxite, when prices are favorable, boosting this as well (United States International Trade Commission, 2017, p. 115). Finally, states like China are pushing for more vertical integration of its national champions in the aluminum industry with its "Nonferrous Metal Industry Development Plan China" (OECD, 2019, pp. 56–57).

In the case of Guinea, its bauxite mines are operated exclusively by transnational companies, as Guinea does not have its own bauxite or aluminum industry. The transnational companies involved there, in turn, own refineries and smelters in other countries, to which they import the bauxite for further processing. However, this level of vertical integration has far-reaching negative consequences for the economic potential of bauxite-rich developing countries, such as Guinea. Vertical integration strengthens a company's control over its production and supplies. The greater the integration, the more control and knowledge has the company over the business and the corresponding market. In addition, competition among a few large transnational companies further increases the degree of vertical integration, ultimately leading to more market power for each of these transnational companies. This is likely to make it difficult for new entrants (e.g., a state-owned company from Guinea) to enter the market, as they will most likely not be able quick enough to compete with the prices of the existing companies. In addition, bauxite has almost no use other than as a raw material for aluminum production. Consequently, new entrants will only be able to offer their bauxite in a market, which is already controlled by a few transnational companies. Therefore, it seems very unlikely that the existing transnational companies might want to buy the new supplier's bauxite. This would only lead to more competition for them. Consequently, it is almost impossible for a new supplier, for example Guinea, to establish itself in the market. In other words, companies will always have an interest in controlling and operating bauxite mines by themselves, which makes it very difficult, at least for any government, to start its own bauxite business and penetrate the aluminum supply chain. This, together with the capital and energy intensive nature of the aluminum business, leads to very unfavorable conditions for any developing country to become active in this sector itself. Therefore, Guinea is quite dependent on the favor of transnational

companies, not only, if it wants to become active itself, but also, if Guinea wants to use and exploit its bauxite potential, since there exist only a few market-dominating companies, thus, tying Guinea to the foreign mining corporations.

### 3.1.2 Governmental Support for Transnational Aluminum Companies

In addition to vertical integration, a high degree of governmental support from the home countries of transnational aluminum giants is another characteristic of the aluminum value chain and the second main obstacle for Guinea resulting out of the aluminum value chain. The high level of governmental support demonstrates the importance of the aluminum industry for other countries and the willingness to support and build national champions. Governmental support is spread in many different forms, for example, from direct financial subsidies of state banks to non-financial subsidies, like energy subsidies or special trade policies. The degree and form of such support can be targeted to a specific field in order to give the company a competitive advantage. In this highly concentrated sector, the largest companies receive the most governmental support. The top five companies receive around 85% of the total support (OECD, 2019, p. 33).

However, it has to be noted that the companies are not always supported through their home country. While Chinese companies often receive large financial subsidies, for example, via Chinese state banks, other foreign companies, like Rio Tinto or Alcoa, receive less support from their home countries, but more from the countries they are operating in (OECD, 2019, p. 6). In addition to such types of support, trade measures are another very common type of government support that target specific parts of the aluminum value chain or encourage vertical integration. For example, the Chinese government introduced an incomplete reduction in value-added tax (VAT) for exporters to incentivize the export of semi-finished products instead of primary aluminum. This created strong incentives for Chinese companies to either acquire semis producers or establish strong trade relationships with Chinese semis producers (OECD, 2019, p. 13).

It must be acknowledged that countries with large transnational aluminum companies, such as China or Russia, have a vested interest in intervening in the business, for example, through the licensing process for a new mine for a Russian or Chinese aluminum company in Guinea. China, for example, constantly expanded its leading role in the aluminum market. In the last 20 years the role of China increased substantially in almost every segment of the aluminum value

chain. Of the top 10 producers of aluminum six of them are Chinese. The global demand of bauxite is increasing, mainly due to the large demand of China, which, however, only can produce half of its own demand. This makes China the largest importer of bauxite, importing around two-thirds of global bauxite imports. This is mainly because of the large increase in demand of Chinese aluminum producers (OECD, 2019, pp. 36–37). China is the biggest player as well in the primary aluminum production, accounting for around 60% of the global primary aluminum output. While the smelting capacities increased in China, they decreased in a couple of OECD countries (OECD, 2019, p. 41). This, together with the large number of different support measures, shows that China is not afraid to intervene actively in the business. The great willingness of foreign states to support their own aluminum giants in various ways shows the enormous influence of such foreign states in this sector. It has to be recognized that the nature of the aluminum business leads easily to interventions in the business by non-producer states. However, it can be very problematic for economically weak countries with large bauxite reserves but without own aluminum companies, such as Guinea, when powerful states with national aluminum giants, such as China, intervene in the negotiations for mining permits or in the business. Thus, Guinea not only has to assert itself against strong aluminum companies with enormous market power, but also against extremely powerful states. Therefore, in the next part of the case study, among other factors, the extent and consequences of such foreign political influence on Guinea will be directly shown and analyzed.

### 3.2 Bauxite Business in Guinea

Besides understanding the aluminum value chain, it is tremendously important to understand the operations of the major bauxite mining companies and their impact on the local population. Within this study the ways of operation of the three major bauxite mining companies in Guinea have been researched. These are the already mentioned companies

(1) Compagnie des Bauxite des Guinée (CBG), headquartered in the USA, Great Britain and the Channel Islands,
(2) Société de Minière de Boké (SMB), headquartered in China, and
(3) Compagnie de Bauxite de Kindia (CBK), headquartered in Russia.

Those companies have different cultural heritages and therefore slightly different ways of operating or of corporate responsibility measures. But all of them have a great importance for Guineas bauxite mining sector. Furthermore, it needs to be taken into account that all these companies are not at all transparent and usually do not disclose any data or information on those topics by themselves. CBK, thereby, was found to be the least transparent company.

The first company, CBG is currently operating three mines in the inland of the Sangarédi region, 135 km away from the port of Kamsar. CBG is a joint venture of the non-Guinean Halco Mining corporation with 51% and the Guinean state with 49% (CBG, 2020). Halco Mining was established in 1962 and is owned by Rio Tinto[5] (45%), Alcoa[6] (45%) and Dadco[7] (10%). Until the recent investment from SMB, CBG was the largest bauxite producer and foreign exchange earner (Delasnerie and Diallo, 2004).

The second company, SMB, is a consortium consisting of Shandong Weiqiao, a Chinese aluminum production company, the Singaporean shipping company Singapore`s Winning Shipping Ltd. and the French-Guinean transport and logistics company United Mining Supply (UMS). SMB has mining concessions for multiple mines in the Boké region. However, SMB has not started operating in all of them yet. In contrast to CBG, the Guinean state holds with 10% a much lower share in SMB (SMB, 2020).[8]

The third company, CBK, is operating in the Kindia region and shipping its bauxite from the port of Conarky. Unlike CBG and SMB, the Guinean state has no shares at all in CBK, since it is 100% owned by UC Rusal, a Russian aluminum giant. CBK was founded in 2001 (Compagnie des Bauxites de Kindia and La Republique de Guinee, 2000). Until today, CBK is Rusal's largest bauxite asset and is accounting for around 25% of Rusal's total bauxite output (Rusal, 2020a). CBK is not the only asset of Rusal in Guinea. It also operates a refinery in Fría (Guinea's only refinery) and owns a second company, which is extracting bauxite of the Guinean Dian Dian mine. Dian Dian has the largest proven bauxite reserves in the world and

[5] Rio Tinto is a British-Australian company, active in mining and the energy sector in multiple countries in the world. It specialized in mining, aluminum, copper, diamonds, minerals and iron ore. Rio Tintos aluminum business emerged with the takeover of the Canadian aluminum producer Alcan. The company operates five bauxite mines (Australia, Brazil and Guinea), four alumni refineries (Australia, Brazil and Canada) and 14 aluminum smelters (Canada, Australia, New Zealand, Iceland and Oman) (Rio Tinto, 2020).

[6] Alcoa was founded in 1888 and became the largest American aluminum producer. Alcoa is active in bauxite mining, refining and smelting of aluminum. The company directly operates four bauxite mines, located in Australia, Guinea, Surinam and Brazil and has ownership in three more. Moreover, Alcoa owns and operates several refineries in Australia, with a total capacity of 17 million tons of alumina per year (ALCOA, 2020d, 2020c, 2020a).

[7] Dadco is specialized on alumina-based products, such as smelter grade alumina and alumina chemicals. It was founded in 1915 and owns the Aluminum Oxid Stade refinery in Lower Saxony near Hamburg, which has a capacity of around one million tons of alumina per year, using bauxite from CBG mines in Guinea (Dadco, 2020).

[8] Shandong Weiqiao is specialized in the production of primary aluminum and the textile industry and a fully owned subsidiary of China Hongqiao, the primary aluminum giant of China perfectly showing the vertical integration from the upstream to the midstream segment of the value chain (China Hongqiao Group Limited, 2020). Shandong Weiqiao is not a new face to bauxite mining as it was active in bauxite mining in Malaysia, Indonesia, Australia and India before (Lianhe Ratings Global, 2019).

will at least double Rusal's total bauxite production in Guinea (OECD, 2019; Rusal, 2020b).[9]

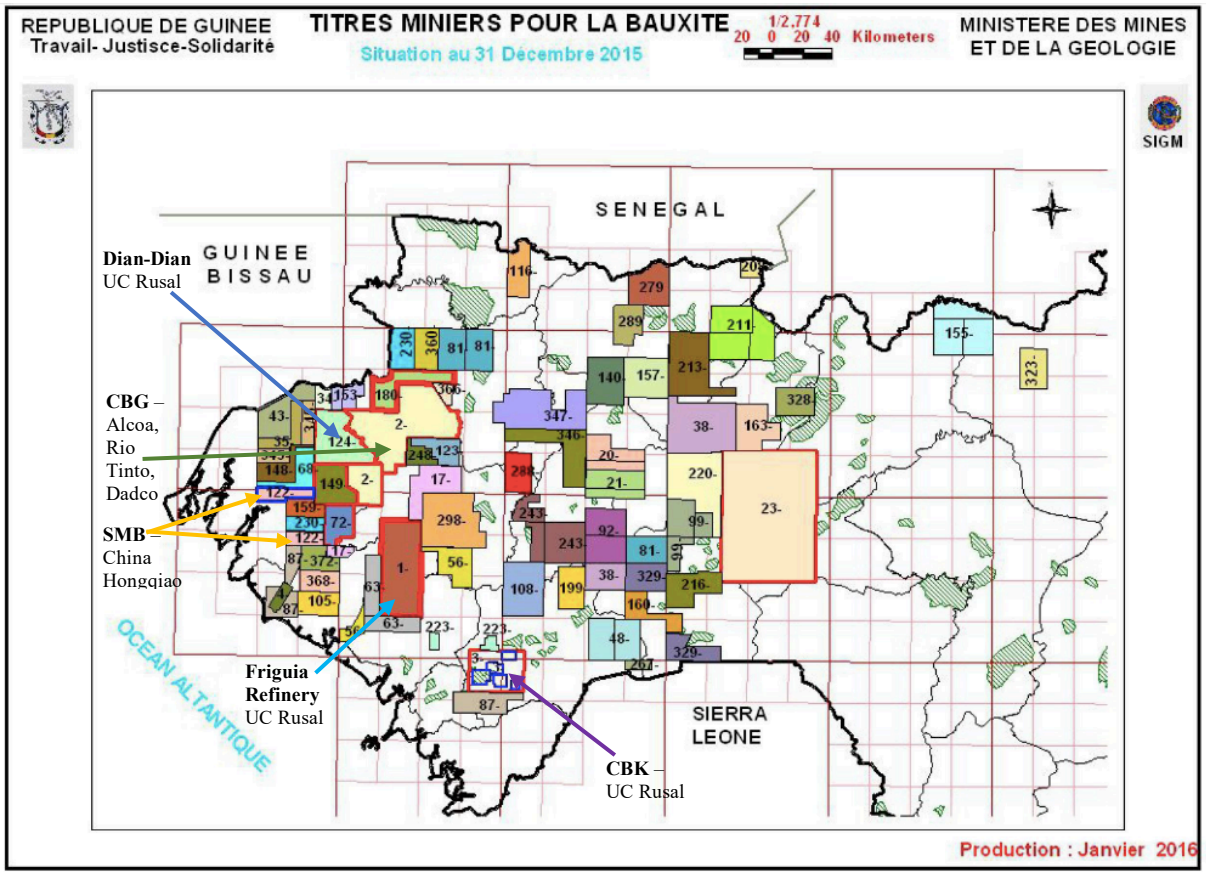


*Figure 4: Map of Bauxite Mining Permits in Guinea* (Ministère des Mines et de la Géologie, 2020).

When researching the ways of operation of these different companies, it can be observed that they use very similar patterns to assert their leverage in order to get the best possible deals, new concessions or the best economic conditions. However, some distinct differences can be observed as well. In the following, the extent and implications of foreign political influence and company leverage on Guinea's bauxite business, as well as the obstacles for the local development arising from unequal and low salaries, and from unsustainable land compensation will be looked closer at. Finally, the obstacles occurring from the bauxite trade in Guinea itself, namely transfer pricing and tax evasion, will be analyzed.

[9] Rusal is a completely vertical integrated company, owning and operating bauxite mines in Russia, Guinea and Guyana as well as refineries and several melters across the world (Rusal, 2020c).

### 3.2.1 Foreign Political Influence on Guinea's Bauxite Business

As already shown, countries with large aluminum companies (usually not the countries with bauxite resources) have great interest in supporting their national champions. Furthermore, that gives them a strong incentive to intervene in negotiations around concession agreements or tax and royalty agreements. This part shows the means used by countries such as China or Russia to exert political influence in favor of their respective aluminum companies operating in Guinea according to their own interest and not to the interest of Guinea. Political influence, thereby, can be applied directly, for example, through diplomatic connections, or indirectly, for example, through debt programs. Furthermore, there is a difference between the degree and type of political influence that is used among the different companies and their home governments.

In this study direct political influence is characterized by close diplomatic connections and personal relations or even direct interference with Guinea's politics. While Russia was not really active in Africa since the fall of the Soviet Union, this changed drastically in the last decade. Its interests are very multilayered and reach from control over oil and gas resources in order to keep its energy leverage in Europe over securing unearthed resources as a strategic reserve to exploration and exploitation of minerals in multiple African countries (Pham, 2014; Besenyő, 2019, p. 136). Guinea and Russia have built a very strong political relation over close personal connections. Current President Condé and the Russian President Putin know each other from several visits, for example, from the Africa Summit in Sochi 2019, where Condé and Putin had one-in-one talks (Kremlin, 2019).

Rusal has very strong ties to the Russian government and is sometimes even considered an almost state-owned company having very strong indirect ties to the Kremlin (Sergey, 2010). The connection between Rusal, the Russian government and the Guinean government is very evident with the appointment of the former Russian ambassador to Guinea, Alexander Bregadze, as head of Rusal's unit in Guinea in March 2019. Bregadze served as Russian ambassador to Guinea for eight years and had most recently interfered in Guinean politics (Camara, 2019). He suggested the current President Condé to amend the constitution for being allowed to run for a third term and also urged Condé to stay in power, because the country would need him and clearly backed his presidency. This was perceived by the political opposition and the media as massive interference in Guinean politics (Reuters Staff, 2019). However, interference directly from the Russian government is not uncommon. For example, in 2016 the Russian government demanded that Guinean authorities protect Rusal's interests

from its rivals (B2B-Export, 2016). Russian-Guinean relations date back to Viktor Boyarkin, who advised Condé's government in advance of a possible extension of Condé's rule. Boyarkin is a highly influential top diplomat with many connections around the world. The U.S. Treasury Department imposed sanctions on him in 2018, labeling him a former military intelligence officer. While Boyarkin denied that he is an adviser to Condé, he claimed that he provides high-level contacts to foreign companies interested in investment opportunities in Guinea. In addition, Boyarkin has close ties to Rusal, having been Rusal's former head of security in Guinea. Boyarkin's relations with Condé since the beginning of his presidency have been very beneficial to Rusal. For example, he helped to resolve disputes with Condé's government after the latter came to power (Meyer and Arkhipov, 2019). This type of direct influence through close personal government contacts has already led to Rusal benefiting from exemptions in the past. For example, Rusal did not have to give shares in its Guinean subsidiary CBK to the Guinean state, got its license renewed on more favorable terms, and is exempt from some taxes (Maclean, 2019). This undermining of general standards can be seen as thoroughly problematic. Moreover, it is highly doubtful, whether these exceptions are economically worthwhile at all for Guinea. Rusal has a different position compared to the other two mining companies in this respect, as it is very closely linked to the Russian government. As has been shown, the Russian government is not afraid to intervene directly in important negotiations or issues in order to create favorable conditions or terms for Rusal. The Russian government even goes so far as to directly influence Guinean domestic politics. This is very problematic, because in many cases the Guinean government has to reach an agreement not only with the Rusal officials, but directly with the much more powerful Russian government.

In addition to active political influence, indirect political influence via an intermediary, e.g. an international organization or a state institution, also hinders Guinea. In this case, measures are taken from a foreign government to increase the chances or speed of an investment. An example would be the granting of loans by a state-owned bank. Especially China used huge state bank loans in order to secure mining concessions for Chinese companies in Guinea. In 2017 Guinea received a 20 billion USD loan from China for infrastructure projects in the next 20 years in exchange for mining concessions for three Chinese companies (Samb, 2017). The loan is secured by the mining taxes and royalties of the projects from those companies. Furthermore, China is financing the construction of several railways in Guinea in order to give the companies including SMB a competitive advantage by being able to transport their bauxite cheaper (Smith, 2018). This gives the Chinese companies tremendous leverage over the Guinean government,

as any action that would significantly affect the production of those three companies would very likely affect the payback of the loan. Moreover, it makes it very unlikely that the Guinean government will punish the companies, if they violate agreements, e.g. by not building a refinery (Smith, 2018). This poses a dilemma for Guinea, as it is urged to rely on foreign loans and capital on one hand, but on the other, becomes more dependent on the home countries of the mining companies increasing the pressure on company-friendly decisions or laws, which will be described below. As a result, Guinea loses influence over the future development of the existing mining investments but also potentially over the granting of new licenses.

### 3.2.2 Company Leverage Against the Guinean Government

In addition to the strong influence of foreign governments, Guinea mainly has to reach agreements directly with the mining companies. In parallel with the enormous market power of the companies in the aluminum value chain, they have a great deal of direct influence in Guinea, which often enables them to assert their interests. While bauxite is very important to the companies' businesses, the investments made by the companies at the same time are hugely important to the Guinean state. For example, Guinea faces the problem of being dependent on the infrastructure of established mining companies, as they supply so-called “mining towns”. Even though, the bauxite mining itself does not require a massive amount of labor, the work around the mining area, such as building and retaining infrastructure or transportation, creates enough jobs, so that new mining towns emerge next to mining areas (Knierzinger and Sopelle, 2019). This can lead to companies using the resulting leverage to enforce their own interests against the Guinean state. Furthermore, such leverage could negatively influence the decision-making power of the Guinean government with regard to the establishment of a local aluminum value chain.

Due to the enormous lack of infrastructure in the country, mining companies were and still are forced to build their own infrastructure in such mining towns. As a result, mining companies have significant control over most of the buildings and infrastructure in the towns, leading to a replacement of the formal political space (Knierzinger, 2018). According to Knierzinger (2018, pp. 44–45), most mining towns are much more intertwined with the corporate governance structure of the mining companies than with the structure of the municipality or the state. Examples include the mining towns of Fria, Sangarédi, Kamsar, and Débélé, which are planned, established, and maintained by international mining companies (Rusal, Alcoa, Rio Tinto). All of these cities have grown significantly over time (Knierzinger, 2017). Mining companies like

the Chinese SMB and the Western CBG are financing the majority of infrastructure projects in the mining towns close to their mines. This leads to a total dependency of the Guinean state on the mining companies in crucial sectors, such as health care. One example would be the Hospital of CBG in Kamsar, which belongs to the state, but is financed by CBG (Knierzinger, 2018, pp. 172, 175). Even though, the private health sector in Sangaredi is less dominant, companies like CBG have almost the total control over investments in public goods compared to the local authorities. This highly concentrated infrastructural power of CBG leads to frequent discontent among local politicians, administrators and the local population. This creates an unequal balance of power between the government and the mining companies. According to the local authorities, the main source for this unequal power relation are non-existent tax payments from the mining company to the local community (Knierzinger, 2018, pp. 180,183,186-187).

Another example that clearly demonstrates this unequal balance of power, is the case of Friguia, Guinea's sole alumina refinery in Fria. Rusal acquired the Friguia refinery in 2006, and while Rusal had major disagreements with Guinea's autocratic leadership until 2010, arguing that privatization of the refinery was not legitimate and that Rusal should pay high compensation, Rusal revealed its leverage for the first time by ceasing tax payments. In addition, Rusal announced that it would not rely on production in Guinea and that it would replace the losses in Guinea with market purchases or production at other facilities (Burgis, Mitchell and Belton, 2010; Knierzinger, 2016). In 2010 strikes broke out with workers demanding a 50% pay rise due to increased fuel prices. In addition, the government was preparing a decree for a minimum wage in the mining sector. Only after nine days of production stoppage due to the strike, Rusal finally submitted to the minimum wage decree (Reuters Staff, 2010). Moreover, the kidnapping of a Rusal senior officer showed the worsened and hostile relationship between Rusal's expatriates and the local population in Fria (Knierzinger, 2016, p. 147). Two years later another strike escalated, when Rusal shut down the refinery completely leading to rapid social decline for around 70.000-80.000 people. Rusal stopped payments for 1030 direct employed workers and 2000 subcontractors (Industriall, 2013). At this time Rusal was very much under financial pressure fighting against insolvency. Therefore, the shutdown of the refinery was very likely beneficial for Rusal. Due to closure of the refinery and since any government structure was replaced by Rusal, Fria now had no access anymore to free electricity, garbage disposal, good water supply or health insurance (Knierzinger, 2016, p. 151). There were several attempts by the government to find an agreement with Rusal to restart the refinery. However, Rusal had no

interest in doing so, when aluminum prices were as low as they were at that time (Knierzinger, 2018, p. 117). Furthermore, Rusal used the shutdown of the refinery to get a new mining concession for the Dian Dian mine and security guarantees (Diouf, 2014). When the government first heard that Rusal was planning to close the refinery, it considered stripping Rusal of its assets in Guinea. However, this led to an immediate intervention by the Russian government, which threatened Guinea that Russia would suspend negotiations on the "Heavily Indebted Poor Countries Initiative" (HIPC) (Knierzinger, 2018, p. 118; see World Bank, 2018). In 2013 the government even admitted that Rusal had more leverage and that there is nothing the government could do (Knierzinger, 2018, p. 122). Finally, Rusal reopened the refinery in Fria in early 2018 (Pacioni, Widder and Bocoum, 2020).

For Guinea, such unequal power balance may entail some crucial disadvantages. One possible example would be the development of a local value chain. As explained earlier, such a local value chain of refineries and smelters would be of great benefit to Guinea, as it would increase the profitability of the bauxite resource. On paper, Guinea has the best conditions for this with its large hydropower potential. However, the electrical infrastructure is poor and to date Guinea has not been able to realize its hydropower potential due to a lack of investment. Building its own refinery and infrastructure is out of question for Guinea, since it lacks the necessary know-how on the one hand, and the project would require an enormous investment sum on the other. Therefore, it is very likely that the company would also have to build the hydropower source due to the poor infrastructure in Guinea. Nevertheless, all companies active in Guinea already have large capacity refineries abroad, so they have almost no incentive to build new plants. For example, Rusal exports almost all of its bauxite to the Nikolaev refinery in Ukraine, which has an annual capacity of 1.7 million tons (ITIE Guinee, 2019, p. 116; Rusal, 2020d). Even, if a refinery in Guinea could reduce transportation costs for the companies, building one is extremely expensive. Although Chinese companies, such as SMB, are most likely to be interested in establishing their own refining structure in Guinea, this remains quite unlikely (Smith, 2018). In fact, SMB has signed a contract with the Guinean government to build a new refinery with a capacity of 1 million tons at a cost of about 3 billion USD. However, it needs to be monitored, whether this project will be realized, as there have been several agreements to build refineries in the past, but none of which have been realized so far (Reuters Staff, 2018).

Considering the immense leverage that mining companies have with control over the infrastructure of mining towns, and the fact that some mining companies were and are not afraid

to use this influence for their advantage, Guinea could be in trouble, especially in terms of developing its own value chain. Since Guinea cannot force the mining companies to build a refinery due to their influence and leverage, commitments and contracts will probably be the only thing, the Guinean government can achieve. This would only change, if the interest of, for example, SMB changed and the company itself pursued the construction of a refinery.

In this context it is worth noting that the bauxite-rich country Indonesia was able to develop domestic refining capacities. However, this was only the case after having banned any exports of bauxite. This example shows the difficulty of establishing domestic refining capacity. Although, Indonesia was very successful with banning its bauxite export, this does not mean that this would also work for Guinea, especially, when considering the much bigger and more diverse economy of Indonesia in comparison to Guinea. Furthermore, Indonesia is way less dependent on bauxite mining then Guinea. Also, Malaysia banned exports of bauxite as well, but it still has to be proven, if this had any impact on the development of domestic refining capacities (OECD, 2019, p. 26). However, drastic remedies, like an export ban on bauxite seem to be very unlikely for Guinea, firstly due to the massive influence of mining companies, and secondly due to the extensive country's economic dependence on the royalties and tax payments from the bauxite mining.

### 3.2.3 Obstacles Deriving From Salaries

In contrast to the previous obstacles, the problems encountered with regard to local development are more of an indirect obstacle, since Guinea generally benefits from improvements in local development. The main obstacles identified in this case study are the unequal and mostly low salaries for core and non-core workers, and the non-existent or insufficient compensation for property of the local population. The latter will be examined in the next subsection. Although bauxite mining employs relatively few workers compared to other non-extractive sectors, it is of great importance for the economic development of the surrounding towns and villages. Thus, the surrounding area theoretically has the potential to become an economic hub. However, this is only possible if, on the one hand, more money is invested in local development and, on the other hand, fair salaries are paid to all employees, including subcontractors. Moreover, mining companies could also benefit from such measures, for example, by reducing the potential for conflicts with the local population and the associated cost savings. It is therefore important to identify the reasons, why this has not yet been done or has been done inadequately.

Since mining, generally, is not very labor-intensive, the number of jobs created directly by mining, is very small compared to its output. Nevertheless, good salaries for workers can boost the local economy, as, for example, more income provides economic opportunities for entrepreneurs and small and medium-sized enterprises in the area. Furthermore, it is important to mention that a large part of the jobs in mining towns are based on the income and demand of the miners. Since there is a shortage of skilled labor in Guinea, it is expected that mining companies are likely to have a larger share of expatriates than in other countries.

Of the three mentioned mining companies, CBG has with 7082 the largest directly employed workforce. It is almost six times larger than the one from SMB (1164) or CBK (1221) in 2017 (ITIE Guinee, 2019, p. 147). Nevertheless, this does not implicit that CBG has more employed workers. Considering SMB's roughly 40% higher production, it seems highly unlikely that SMB can operate its mining project with so few employees (Ministère des Mines et de la Géologie, 2018, p. 1). Since subcontracting, which is much cheaper than direct employment, is very common in the extractive industry, it is very likely that CBK and SMB subcontract more workers than CBG. It appears that CBK relies largely on subcontractors, as Rusal uses a system of Rusal-led subcontracting companies in Guinea to drive down salaries, cut worker benefits, and curtail union power. Rusal not only introduces a very strong working hierarchy, but also does not have to pay for benefits, such as free housing or health care for most subcontractors (Knierzinger, 2016, p. 147).

Unfortunately, none of the companies disclose data on their salaries. Therefore, the total sum of salaries is estimated by the amount of taxes paid on salaries per employee, as all mining companies have to disclose tax data to the EITI Transparency Initiative. In 2017 CBG payed 1.533.947 USD (13.803.175.985 GNF) taxes on its salaries (ITIE Guinee, 2019, p. p.224). Divided by the number of employees CBG paid 216 USD taxes per employee.[10] SMB paid a total amount of 118.844 USD (1.069.417.557 GNF), 73% less than CBK, which was paying 437.497 USD (3.936.804.198 GNF) in 2017 (ITIE Guinee, 2019, pp. 225, 228). Accounted on its employees SMB paid only 102 USD taxes on salaries per employee, whereas CBK paid 358 USD. Although it may appear as if CBK pays the highest salaries, this most likely is not the case, as the company increasingly uses subcontractors. In addition, it must be acknowledged

[10] This and all following conversions are based on the GNF USD exchange rate of the 31.12.2017, if not stated otherwise.

that these figures must be interpreted cautiously, as they say nothing about the distribution of salaries. There are also reports that CBK is exempt from paying taxes on land and salaries (Maclean, 2019). Thus, it is quite possible that companies pay large salaries to managers and expatriates and only small salaries to local workers. According to government data, SMB and CBG had a larger share of non-Guinean workers in 2017 than CBK. 89,7% of SMB's workers were Guinean in 2017. In 2016 this share was only 66,5%. CBG employed 99,2% Guinean workers in 2016 but only 94,8% in 2017. For CBK 97,4% of its workers were Guinean in 2016 and 2017 (Ministère des Mines et de la Géologie, 2018, p. 7). Given that SMB only began its production in 2015, the notably low proportion of Guinean workers in 2016 is not surprising. The lower share for CBG in 2017 can be explained by CBG's mine expansion and, thus, an increased demand for expatriates (Ministère des Mines et de la Géologie, 2018). However, as reports of poor working conditions reveal, SMB actually pays very low wages (Aluminium Insider, 2019). In addition, SMB has experienced frequent strikes in the past years, with strikers mostly complaining about poor working conditions (Aluminium Insider, 2018, 2019). Although it is likely that SMB does not have an equal distribution of wages between expatriates, managers, and local workers, there have been no reports to support this assumption. According to Knierzinger (2018, pp. 142–145), CBK not only has significantly worse working conditions than CBG, but also pays less wages to its local workers and even less to contract workers and subcontractors. Moreover, it is very likely that at CBK there is a very unequal distribution of salaries between local workers and expatriates, as is the case at the Rusal facility in Fria (Knierzinger, 2018, p. 95).

In general, the core workforce of CBG and CBK receives quite high salaries by Guinean standards. However, the core workforce comprises only a few hundred/thousand workers depending on the company. Nevertheless, their income provides the demand for most other businesses in mining towns and the surrounding villages (Knierzinger, 2018, pp. 95, 184–186). Other employees who make up the majority of the workforce, such as subcontractors, receive very low wages compared to the Guinean standard. However, core workers can use their wages to send part of their family to better schools or to IT or English courses, which would greatly improve their job prospects, and the feeding of their entire family, as shown impressively by the example of a family of 26 persons living on the salary of one single relative, working at CBG (Knierzinger, 2018, pp. 159–162, 184). A higher income for non-core workers could, thus, significantly boost the region's economic development by reducing poverty and promoting opportunities, even for people not being employed by mining companies. Furthermore, higher

salaries for these workers would increase the overall demand and, thus, drive economic growth in the region.

### 3.2.4 Obstacles Connected With Land Compensation Policy

Especially with regard to the development of the local population, sustainable land compensation is very important for the economic development of the region. This would ensure that landowners also have an economic perspective afterwards and can contribute to the economic development of the region. Mining areas are usually very large, and the loss of land means the loss of agricultural production and economic opportunities for local people. Thus, unsustainable land compensation is another major obstacle for Guinea.

CBG renewed its land compensation policy in 2015, preferring land-for-land compensation (people will receive other land as compensation for their lost property), instead of financial compensation. However, until then, CBG usually paid no compensation at all or at least very little, when compared to the loss of land and agricultural production. Even though, CBG updated its land policy in 2015, CBG did not implement it until 2018. Due to very frequent confrontations over land compensation with the local population, CBG introduced a new 1.9 million USD program that should help to develop new income sources for the local population (HRW, 2018, pp. 47–57). Nonetheless, it appears that CBG is still lagging behind in its land compensation program and resettlement practices. For example, according to one report, CBG relocated approximately 100 families to unfinished resettlement sites during the Covid 19 pandemic (Inclusive Development International, 2020). However, no or little compensation prevented those, who were affected from establishing a new economic livelihood or finding a new source of income. Furthermore, the loss of their own land pushes many into the social abyss. All in all, the economic prospects for the region as well as the living situation of the affected persons worsens with no compensation.

Unlike CBG, SMB takes a different approach and pays locals and farmers adequate compensation for their land and for the plants and trees that grow on it. This seems to lead to much less tension with local people and has allowed SMB to acquire new land very quickly. However, this approach also has substantial weaknesses. For example, SMB used this approach to compensate entire communities. According to several reports, people complained that the money was distributed very unequally or that it was wasted on projects, which did not benefit them. Moreover, the paid amount, which is after all high (in terms of the value of the land),

does not replace lost income for local people due to land loss (HRW, 2018, pp. 57–61). As a result, the long-term economic prospects for the local population decreases as well.

According to Knierzinger (2018, pp. 139–140), CBK did not compensate local people in the most cases. The mine in Débélé may soon be closed due to exhaustion, but even, if locals were to get back their land, it no longer would have any agricultural value, as it has been polluted for a long time. This coincides with other reports, whereafter people have never received any form of compensation for their land (The New Humanitarian, 2008). The land compensation policy shows that although mining clearly benefits the Guinean state, the overall issue of compensation poses a great risk to the region and its economic development, if compensation is not paid for the loss of the land, and sources of income are lost and not replaced.

As has been shown in this and the previous subsection, Guinea could benefit much more regionally from its bauxite resources. However, mining companies would have to pay higher salaries to their workers and subcontractors and pursue a more sustainable land compensation strategy. This would also benefit the mining companies, as the negative impact of mining on the daily life of the local population leads to significant discontent among them. One example of possible outcomes for this is the town Boké, which has been the center of violent protests in 2017 (HRW, 2018, pp. 32–33). The first protests broke out in April because of power cuts, the lack of jobs, and the increased pollution by the mining companies. During those protests several persons were wounded, and one person was shot dead (Cocks, 2017; Reuters Staff, 2017b). Later in September new protests sparked, during which at least 9 persons were shot dead. The protests affected the production of CBG as well as SMB and even forced CBG to halt its production (Africa Times, 2017; Reuters Staff, 2017a). With better salaries, working conditions, and more sustainable land compensation, not only could the region develop positively economically, but mining companies could also save on costs incurred due to conflicts.

### 3.2.5 Transfer Pricing and Tax Evasion

For Guinea, in addition to the obstacles already explained, major problems arise also directly from the bauxite trade. Two problems are particularly noteworthy. First, since, as already mentioned, most aluminum companies have subsidiaries in almost every segment of the aluminum value chain, the mined bauxite is sold only within this corporate structure. So-called “transfer prices” are charged for this. This is also the case in Guinea and makes it difficult for

the government to determine correct prices for the bauxite or to determine the correct value of a delivery. The other problem is tax evasion, which results from lack of control and the specifics of the aluminum market. In the following, both problems will be explained in more detail.

In order to explain the problem of transfer pricing in more detail, a definition and explanation is inevitable. Readhead (2016, p. 1) defines it as follows:

*"Transfer pricing is the mechanism by which prices are chosen to value transactions between related legal entities within the same multinational enterprise (MNE). These are referred to as `controlled transactions´ and may include the purchase and sale of goods or intangible assets, the provision of services, the provision of financing, cost allocation, and cost sharing agreements. As long as the price that is set matches the `arm's length´ price at which a transaction would have taken place between unrelated parties, this is not problematic. However, transfer pricing may become abusive or illegal when related parties seek to distort the price as a means of reducing their overall tax bill. In these instances, the practice may be referred to as `transfer mispricing´."*

In contrast to other obstacles already mentioned that keep Guinea from higher profitability, the problem of transfer prices or, more precisely, of transfer mispricing is mainly due to insufficient measures taken by the Guinean government. For example, the Ministry of Mines and Geology does not control the quality of bauxite exports, which leaves considerable room for possible irregularities. Furthermore, the Ministry requires SMB to have every shipment checked and valued through an independent third-party company. However, SMB will pay this company and not the Ministry (Readhead, 2018, p. 43). In addition, there is no clear regulation for the submission of export and production information. CBG is currently the only company that is submitting information on a monthly basis. All other companies are only submitting information on request of the Ministry of Mines and Geology. Due to lacks of facilities, such as laboratories and capacities, the Ministry is not able to perform controls of the quality of the exported bauxite, resulting in the risk of underpricing the bauxite exports (Readhead, 2018, pp. 43–45).

According to Readhead (2016, p. 17), the Guinean government needs to prioritize a transfer pricing reform to minimize this problem. Furthermore, tax officials require additional training regarding transfer pricing and its relation to the mining sector. However, the national tax

administration is only capable of controlling transfer pricing, if they work closely together with the Ministry of Mines and Geology and follow a simple and contextual approach. In addition to such a reform, the government needs to invest in laboratories and capacity to appropriately control bauxite exports. According to an OECD and IGF (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development) report (Readhead, 2018), there is a high risk of undervaluation of bauxite exports and therefore, the Guinean government should seek direct controls, including sampling, sample preparation, and testing, to address the problem of undervalued bauxite exports.

Besides those legal tax loopholes, there are reports of international transparency watchdogs reporting that some companies are making own deals with the Guinean government and are, therefore, excluded from paying taxes on land and salaries (Maclean, 2019). The Guinean government has relatively good tax measures on paper. However, such negotiations over the applicability of the tax regime to each individual project allow mining companies to use their extreme leverage to obtain advantageous tax incentives. Additionally, this cripples the tax administration, having to deal with very different fiscal regimes on every project (Natural Resource Governance Institute, 2016, pp. 8–9). Therefore, making those kind of deals, harms Guinea twice. First, it favors unfavorable tax and royalties for the government, and second, it leads to a very complicated system of different agreements, which are impossible to check for responsible administrations.

The second problem connected to the bauxite trade that arises for Guinea is tax evasion. It has to be acknowledged that tax evasion is very common in this business, and often facilitated by the company's vertical integration. For example, Dadco, the third partner of CBG, has its head office on the Channel Islands, even though the company exports almost all of its bauxite to its refinery to the city Stade in Lower Saxony, Germany (Dadco, 2020). Besides international tax evasion there are three anti-tax avoidance rules that are relevant to the Guinean government. First, companies are constantly reporting losses, mainly due to high debts. Hence, this is delaying the payment of corporate income tax. That process is called "thin capitalization" (Readhead, 2016, p. 4). Second, mining companies in Guinea enter so-called "Long-Term Pricing Agreements" (LTPA). While this is not necessarily a problem itself, the government complains that pricing formulas used in such agreements are too complex and, therefore, the government cannot control the agreements. Nevertheless, mining companies dispute this on the grounds that there is a lack of government will with regard to review the agreements. At the

end, this leads to lower incentive for the companies to submit their agreements for approval (Readhead, 2016, p. 5). Third, as other countries with natural resources, Guinea is charging royalties on minerals. Those royalties should be based on either publicly quoted prices, or comparable products being sold on the market. However, the used price indices are not indicating true arm's length prices by not taking the characteristics of each transaction into account. Still, they function as proxies to prevent the companies from charging for sales to related parties. Although the Guinean government has a subscription of the London Metal Exchange in order to check UpToDate prices, the subscription is not available for the national tax administration (Readhead, 2016, p. 6). As with the transfer mispricing problem, the extent of tax evasion could be significantly reduced with controls and legislative changes. Nevertheless, the effort involved should not be underestimated, especially in view of the inadequate institutional quality in Guinea. Improvements in this area can, therefore, be expected to be slow.

# 4. Conclusion

Although Guinea has great economic potential on paper due to its mineral resources and enormous water reserves, it has not yet been able to develop this potential and even lags behind other African countries with no or significantly fewer natural resources in terms of economic development. Guinea should benefit greatly from its vast bauxite deposits, but the gains are severely limited, raising the questions on the reasons that are holding back Guinea from profiting more. In examining the mechanisms behind the resource bauxite and operations in Guinea directly, several obstacles were discovered that are or may be responsible for Guinea's low profitability. Contrary to prevailing assumptions in the resource curse debate, Guinea's economic problems appear to depend not only on institutional quality, corruption, and economic mismanagement, but also on the unequal power relations of the Guinean government vis-à-vis mining companies and powerful states.

Although this study is not able to clarify, which of the mentioned factors are the most significant, this leads to the question, whether the approach of previous literature on the resource curse phenomenon should be modified in the future to include the possible barriers to greater profitability. The results of this case study clearly show that more research in this direction is needed. Furthermore, the importance of the individual mechanisms behind bauxite could be shown by this case study. Therefore, more research on the individual mechanisms

behind other natural resources is absolutely necessary to understand and address the problems behind the resource curse phenomenon.

As this case study has made clear, Guinea is severely limited in its ability to extract more profit from its bauxite resource. The Guinean government is largely powerless to make changes to this situation. The high degree of vertical integration makes independent entry into the business by the Guinean government not only difficult, but virtually impossible. In addition, the large amounts of government support for aluminum companies demonstrates the great likelihood for large involvement and strong interest in aluminum production by other powerful countries, such as China or Russia (mostly the home countries of large aluminum companies). Moreover, the examples of China and Russia show the great extent and implications of the exercise of political influence directly in Guinea. In particular, Russia's direct interference in the political process in Guinea must be seen as extremely problematic. However, such Russian intervention is also not without risk, since in the event of a change of government, open Russian support for the current government could prove very negative for Rusal. Guinea, thus, is not only dealing with gigantic and powerful international mining corporations, but also with extremely financially strong and politically powerful countries, which severely limits Guinea's potential and leverage over its bauxite resources.

In addition to the great market power, all three examined companies control sensitive infrastructure and, thus, more or less determine the well-being of entire mining towns in Guinea. The resulting imbalance of power leaves the Guinean government very little room for maneuver, when it comes to implementing and enforcing new regulations in its favor. As the example of a possible local value chain in Guinea shows, Guinea is not able to control the future development of the bauxite investments, as the decision-making power lies with the aluminum companies.

Besides those factors, Guinea could also profit more from indirect benefits, such as increased local economic development. However, as far as the contribution to local development is concerned, there is also a strong need for improvement. Higher salaries for the entire workforce could contribute to the economic development in the mining regions. Even though bauxite mining itself requires only a limited number of employees, those relatively few workers create the demand for a large number of jobs in the surrounding area. However, the government's hands are largely tied in this matter as well, as the dispute over Rusal's refinery in Fria illustrates very well. The prevailing approaches to land compensation have been improved in recent years,

but they do not promote sustainable economic development. It must be added that the impact of these measures is rather small compared to the other factors mentioned. Nevertheless, they should not and must not be underestimated.

It also has to be noted that Guinea has not consistently implemented some measures that would lead to increased profitability. For example, the government should check the quality of bauxite supplies and simplify the work processes between the Ministry of Mines and Geology and the tax administration and link them more closely. Also, the generalization of mining concessions and the avoidance of tax exemptions would significantly increase revenues.

It must be recognized that it is not possible to determine the exact reasons for the occurrence of exemption deals in the past. However, it is very likely that one or a combination of the reasons mentioned in this case study have contributed to it. Looking at the current situation, it does not appear that Guinea will be able to increase the profitability of its bauxite business in the near future. Furthermore, this case study raises the question of how far global aluminum companies should be regulated or what practices they should adopt, when operating in developing countries. The massive political influence on this industry should also be questioned and investigated further.

# Bibliography

AFDB (2020) *Guinea Economic Outlook*, *African Development Bank Group*. Available at: https://www.afdb.org/en/countries/west-africa/guinea/guinea-economic-outlook (Accessed: 2 November 2020).

Africa Times (2017) 'Guinea: New clashes erupt in Boke bauxite mining center', *Africa Times*, 13 September. Available at: https://africatimes.com/2017/09/13/guinea-new-clashes-erupt-in-boke-bauxite-mining-center/ (Accessed: 18 November 2020).

ALCOA (2020a) *Alumina*. Available at: https://www.alcoa.com/global/en/what-we-do/alumina (Accessed: 16 November 2020).

ALCOA (2020b) *Aluminum*, *ALCOA*. Available at: https://www.alcoa.com/global/en/what-we-do/aluminum (Accessed: 10 November 2020).

ALCOA (2020c) *Bauxite*. Available at: https://www.alcoa.com/global/en/what-we-do/bauxite (Accessed: 16 November 2020).

ALCOA (2020d) *Our History*. Available at: https://www.alcoa.com/global/en/who-we-are/history/ (Accessed: 11 November 2020).

Aljazeera (2020) 'Nearly two dozen dead in Guinea post election violence: State TV', *Aljazeera*, 27 October. Available at: https://www.aljazeera.com/news/2020/10/27/guinea-post-election-violence-left-21-dead-state-tv (Accessed: 2 November 2021).

Aluminium Insider (2018) *Societe Miniere de Boke's Bauxite Mine Back Online After Nearly Two Week Strike*, *Aluminium Insider*. Available at: https://aluminiuminsider.com/societe-miniere-de-bokes-bauxite-mine-back-online-after-nearly-two-week-strike/ (Accessed: 1 December 2020).

Aluminium Insider (2019) *Worker Strikes in Guinea Paint Dark Picture for Chinese Bauxite Operations*, *Aluminium Insider*. Available at: https://aluminiuminsider.com/worker-strikes-in-guinea-paint-dark-picture-for-chinese-bauxite-operations/ (Accessed: 1 December 2020).

Aluminum for Future Generations (2018) *Refining Process*, *The International Aluminum Institute*. Available at: https://bauxite.world-aluminium.org/index.php?id=208&L=0 (Accessed: 5 November 2020).

El Anshasy, A. A. and Katsaiti, M.-S. (2013) 'Natural resources and fiscal performance: Does good governance matter?', *Journal of Macroeconomics*, 37, pp. 285–298.

Arezki, R. and Brückner, M. (2011) 'Oil rents, corruption, and state stability: Evidence from panel data regressions', *European Economic Review*, 55(7), pp. 955–963.

Australian Aluminum Council (2020) *Semi Fabrication and Products*, *Australian Aluminum Council*. Available at: http://aluminium.org.au/how-aluminium-is-made/semi-fabrication-and-products-chart/ (Accessed: 4 November 2020).

Auty, R. M. (1994) 'Industrial policy reform in six large newly industrializing countries: The resource curse thesis', *World Development*, 22(1), pp. 11–26.

B2B-Export (2016) *Russia calls on Guinea to protect interests of Rusal aluminum producer*. Available at: https://blog.b2b-export.co/en/russia-calls-on-guinea-to-protect-interests-of-rusal-aluminum-producer/ (Accessed: 20 November 2020).

Badeeb, R. A., Lean, H. H. and Clark, J. (2017) 'The evolution of the natural resource curse thesis: A critical literature survey', *Resources Policy*, 51, pp. 123–134.

Bavier, J. (2019) 'Guinea boosts power output to foster bauxite refining', *Reuters*, 26 April. Available at: https://www.reuters.com/article/guinea-mining/guinea-boosts-power-output-to-foster-bauxite-refining-idINKCN1S2236 (Accessed: 14 November 2020).

Besenyő, J. (2019) 'The Africa Policy of Russia', *Terrorism and Political Violence*. Routledge, 31(1), pp. 132–153.

Brunnschweiler, C. N. and Bulte, E. H. (2008) 'The resource curse revisited and revised: A tale of paradoxes and red herrings', *Journal of Environmental Economics and Management*, 55(3), pp. 248–264.

BTI (2019) *Guinea Country Report 2020*. Available at: https://www.bti-project.org/en/reports/country-report-GIN-2020.html (Accessed: 1 November 2020).

Burgis, T., Mitchell, T. and Belton, C. (2010) 'Guinea demands share of UC Rusal offering', *Financial Times*, 25 January. Available at: https://www.ft.com/content/97145e86-09df-11df-8b23-00144feabdc0 (Accessed: 16 November 2020).

Camara, O. (2019) 'Rusal Names Controversial Former Ambassador as Head of Guinea Office', *Bloomberg*, 25 May. Available at: https://www.bloomberg.com/news/articles/2019-05-25/rusal-names-controversial-ex-ambassador-to-head-guinea-office (Accessed: 16 November 2020).

Cambridge Dicitionary (2014) 'vertical integration', *Cambridge Dictionary*. Cambridge University Press. Available at: https://dictionary.cambridge.org/de/worterbuch/englisch/vertical-integration (Accessed: 18 November 2020).

Cavalcanti, T. V. de V, Mohaddes, K. and Raissi, M. (2011) 'Growth, development and natural resources: New evidence using a heterogeneous panel analysis', *The Quarterly Review of Economics and Finance*, 51(4), pp. 305–318.

CBG (2020) *Qui sommes nous?*, *Compagnie des Bauxite de Guinée*. Available at: http://www.cbg-guinee.com/a-propos/qui-sommes-nous/ (Accessed: 10 November 2020).

China Hongqiao Group Limited (2020) *Who are we*. Available at: http://en.hongqiaochina.com/overview.html (Accessed: 16 November 2020).

Cocks, Ti. (2017) 'Guinea town's unrest a cautionary tale for African mining', *Thomson Reuters Foundation News*, 12 May. Available at: https://www.reuters.com/article/guinea-mines/guinea-towns-unrest-a-cautionary-tale-for-african-mining-idINKBN1881CC (Accessed: 24 November 2020).

Compagnie des Bauxites de Kindia and La Republique de Guinee (2000) *Concession agreement*. Available at: https://www.contratsminiersguinee.org/contract/ocds-591adf-9112931197/view#/pdf (Accessed: 16 November 2020).

Dadco (2020) *About Dadco*. Available at: http://dadcoalumina.com/about/ (Accessed: 11 November 2020).

Delasnerie, S. and Diallo, A. (2004) *Guinea: Transforming a geological scandal in an economic mirracle?*, *Aluminum International Today*. Available at: https://www.gbreports.com/wp-content/uploads/2014/12/Guinea_Aluminium2004.pdf (Accessed: 13 November 2020).

Diouf, A. (2014) *Business & human rights in Guinea: Urgent action needed by companies & government to avoid business involvement in abuse, improve contributions to transparency & poverty reduction*, *Business & Human Rights Resource Centre*. Available at: https://www.business-humanrights.org/en/blog/business-human-rights-in-guinea-urgent-action-needed-by-companies-government-to-avoid-business-involvement-in-abuse-improve-contributions-to-transparency-poverty-reduction/ (Accessed: 26 November 2020).

Donoghue, A. M., Frisch, N. and Olney, D. (2014) 'Bauxite mining and alumina refining: process description and occupational health risks', *Journal of occupational and environmental medicine*. American College of Occupational and Environmental Medicine, 56(5 Suppl), pp. S12–S17.

Eregha, P. B. and Mesagan, E. P. (2016) 'Oil resource abundance, institutions and growth: Evidence from oil producing African countries', *Journal of Policy Modeling*, 38(3), pp. 603–619.

Gilberthorpe, E. and Papyrakis, E. (2015) 'The extractive industries and development: The resource curse at the micro, meso and macro levels', *The Extractive Industries and Society*, 2(2), pp. 381–390.

Gilberthorpe, E. and Rajak, D. (2017) 'The Anthropology of Extraction: Critical Perspectives on the Resource Curse', *The Journal of Development Studies*. Routledge, 53(2), pp. 186–204.

Gylfason, T. (2001) 'Natural resources, education, and economic development', *European Economic Review*, 45(4), pp. 847–859.

HRW (2018) *What Do We Get Out of It?*, *Human Rights Watch*. Available at: https://www.hrw.org/sites/default/files/report_pdf/guinea1018_web2.pdf (Accessed: 19 November 2020).

IMF (2017) *Guinea - Economic development documents*, *International Monetary Fund*. Washington, DC. Available at: https://www.imf.org/en/Publications/CR/Issues/2017/12/19/Guinea-Economic-Development-Documents-45493 (Accessed: 8 November 2020).

Inclusive Development International (2020) *The Relocation of Hamdallaye Village in the Midst of Covid-19*. Available at: https://www.inclusivedevelopment.net/wp-content/uploads/2020/06/Hamdallaye-English.pdf?__cf_chl_captcha_tk__=77679e6d9251b0cc70c0154226409367593fe8e2-1606906790-0-Ac0QWtXSEoOjBIEedy-uds5XBsSosWALZl9Xob4ytBNVEk1Is8RVLhU6ItfDWmLvxiTQNYcQcG-QGhKzD3y2HZnt9_iX (Accessed: 27 November 2020).

Industriall (2013) *The drama of Rusal Friguia workers in Guinea*, *Industriall*. Available at: http://www.industriall-union.org/the-drama-of-rusal-friguia-workers-in-guinea (Accessed: 26 November 2020).

International Trade Administration (2019) *Guinea - Market Overview*, *U.S. Department of Commerce*. Available at: https://www.export.gov/apex/article2?id=Guinea-Market-Overview (Accessed: 1 November 2020).

Isham, J. *et al.* (2005) 'The Varieties of Resource Experience: Natural Resource Export Structures and the Political Economy of Economic Growth', *The World Bank Economic Review*, 19(2), pp. 141–174.

ITIE Guinee (2019) *Initiative pour la transparence dans les industries extractives - Rapport 2017*. Available at: https://eiti.org/node/10724 (Accessed: 22 November 2020).

Kerkow, U., Martens, J. and Müller, A. (2012) *Vom Erz zum Auto - Abbaubedingungen und Lieferketten im Rohstoffsektor und die Verantwortung der deutschen Automobilindustrie*. Achen/Bonn/Stuttgart. Available at: https://www.cidse.org/wp-content/uploads/2012/08/Misereor_Study_Sept_3102_Vom_Erz_zum_Auto-final.pdf (Accessed: 22 November 2020).

Knierzinger, J. (2014) 'The socio-political implications of bauxite mining in Guinea: A commodity chain perspective', *The Extractive Industries and Society*, 1(1), pp. 20–27.

Knierzinger, J. (2016) 'Fria in Guinea: A Dismissed Bauxite Town', *Stichproben. Wiener Zeitschrift für kritische Afrikastudien.*, 16(30), pp. 137–160.

Knierzinger, J. (2017) 'Mining Towns as Portals of Globalization', *Comparativ*, 27(3-4), pp. 94-110.

Knierzinger, J. (2018) *Bauxite Mining in Africa*. Cham: Palgrave Macmillan.

Knierzinger, J. and Sopelle, I. T.-I. (2019) 'Mine closure from below: Transformative movements in two shrinking West African mining towns', *The Extractive Industries and Society*, 6(1), pp. 145–153.

Kniezinger, J. (2016) 'Fria in Guinea: A Dissmised Bauxite Town', *Stichproben. Wiener Zeitschrift für kritische Afrikastudien.*, 16(30), pp. 137–160.

KPMG (2014) *Guinea - Country mining Guide*. Available at: https://assets.kpmg/content/dam/kpmg/pdf/2014/07/guinea-mining-guide.pdf (Accessed: 8 November 2020).

Kremlin (2019) *Meeting with President of Guinea Alpha Condé*, *Presidential Executive Office*. Available at: http://en.kremlin.ru/events/president/news/61901 (Accessed: 20 November 2020).

Kvande, H. (2014) 'The Aluminum Smelting Process', *Journal of occupational and environmental medicine / American College of Occupational and Environmental Medicine*, 56 Suppl 5, pp. 2-4.

Lanciné, C. and Mijiyawa, A. G. (2020) *Structural change and productivity growth in Guinea*. 9341. Available at: http://documents1.worldbank.org/curated/en/643751596034468812/pdf/Structural-Change-and-Productivity-Growth-in-Guinea.pdf (Accessed: 6 November 2020).

Lianhe Ratings Global (2019) *China Hongqiao Group Limited - Initial Issuer Report*. Available at: https://lhratingsglobal.com/wp-content/uploads/bsk-pdf-manager/Rating_Report_China_Hongqiao_20190920_120.pdf (Accessed: 13 November 2020).

Maclean, R. (2019) '"Russians have special status": politics and mining mix in Guinea', *The Guardian*, 27 August. Available at: https://www.theguardian.com/world/2019/aug/27/russians-have-special-status-politics-and-mining-mix-in-guinea (Accessed: 1 December 2020).

Manzano, O. and Rigobon, R. (2001) *Resource Curse or Debt Overhang?*, *Naional Bureau of Economic Research Working Paper Series*. 8390. Cambridge.

Mavrotas, G., Murshed, S. M. and Torres, S. (2011) 'Natural Resource Dependence and Economic Performance in the 1970–2000 Period', *Review of Development Economics*. John Wiley & Sons, Ltd, 15(1), pp. 124–138.

Mehlum, H., Moene, K. and Torvik, R. (2006) 'Institutions and the Resource Curse', *The Economic Journal*, 116(508), pp. 1–20.

Meyer, H. and Arkhipov, I. (2019) 'How Putin Got a New Best Friend Forrever in Africa', *Bloomberg*, 21 December. Available at: https://www.bloomberg.com/news/articles/2019-12-21/-guru-putin-blacklisted-agent-back-african-ally-rankling-west (Accessed: 3 December 2020).

Ministere des Mines et de la Geologie (2018) *Bulletin Statistiques Minieres*. Available at: https://www.stat-guinee.org/images/Documents/Publications/SSN/mmg/Bulletin_MMG_N001_dec_2018_opt.pdf (Accessed: 1 November 2020).

Ministère des Mines et de la Géologie (2016) *Unlocking Guinea's potential*, *Republic of Guinea - Ministery of Mines and Geology*. Available at: https://mines.gov.gn/en/priorities/unlocking-guinea-potential/ (Accessed: 1 November 2020).

Ministère des Mines et de la Géologie (2020) *Bauxite: becoming a world leading producer*. Available at: https://mines.gov.gn/en/resources/bauxite/ (Accessed: 14 December 2020).

Natural Resource Governance Institute (2016) *Country Strategy Note - Guinea*. Available at: https://resourcegovernance.org/sites/default/files/documents/nrgi_guinea-strategy_20160629.pdf (Accessed: 16 November 2020).

Norsk Hydro (2020a) *Aluminumoxid*, *Norsk Hydro*. Available at: https://www.hydro.com/de-DE/aluminium/products/bauxit-und-aluminiumoxid/aluminiumoxid/ (Accessed: 10 November 2020).

Norsk Hydro (2020b) *Bauxite*, *Norsk Hydro*. Available at: https://www.hydro.com/de-DE/aluminium/products/bauxit-und-aluminiumoxid/bauxit/ (Accessed: 10 November 2020).

OECD (2019) *Measuring distortions in international markets - The aluminum value chain*, *OECD Trade Policy Papers*. Paris. Available at: https://www.oecd-ilibrary.org/content/paper/c82911ab-en (Accessed: 4 November 2020).

Pacioni, T., Widder, L. and Bocoum, O. (2020) 'Sustainably Growing Guinea's Bauxite-Aluminum Industry', in Edomah, N. (ed.) *Regional Development in Africa*. IntechOpen.

Papyrakis, E. (2017) 'The Resource Curse - What Have We Learned from Two Decades of Intensive Research: Introduction to the Special Issue', *The Journal of Development Studies*. Routledge, 53(2), pp. 175–185.

Papyrakis, E. and Gerlagh, R. (2004) 'The resource curse hypothesis and its transmission channels', *Journal of Comparative Economics*, 32(1), pp. 181–193.

Pham, J. P. (2014) *Russia's Return to Africa*, *Atlantic Council*. Available at: https://www.atlanticcouncil.org/commentary/article/russia-s-return-to-africa/ (Accessed: 28 November 2020).

Van Der Ploeg, F. and Poelhekke, S. (2017) 'The Impact of Natural Resources: Survey of Recent Quantitative Evidence', *The Journal of Development Studies*. Routledge, 53(2), pp. 205–216.

Prebisch, R. (1962) 'The economic development of Latin America and its principal problems', *Economic Bulletin for Latin America*, 7(1), pp. 1–22.

Readhead, A. (2016) *Transfer Pricing in the Mining Sector in Guinea*, *Natural Resource Governance Institute*. Available at: https://resourcegovernance.org/sites/default/files/documents/nrgi_guinea_transfer-pricing-study.pdf (Accessed: 6 November 2020).

Readhead, A. (2018) *Monitoring the value of mineral exports: Policy options for governments*. Ottawa, Paris, Winnipeg. Available at: https://www.oecd.org/tax/beps/monitoring-the-value-of-mineral-exports-oecd-igf.pdf (Accessed: 8 November 2020).

Reuters Staff (2010) 'Guinea mulls mining pay as Rusal strike continues', *Reuters*, 9 April. Available at: https://www.reuters.com/article/guinea-rusal-strike/guinea-mulls-mining-pay-as-rusal-strike-continues-idINLDE6381M020100409 (Accessed: 13 November 2020).

Reuters Staff (2017a) ‘Guinean protests halt bauxite miner CBG’s operations’, *Reuters*, 19 September. Available at: https://www.reuters.com/article/us-guinea-mining/guinean-protests-halt-bauxite-miner-cbgs-operations-idUSKCN1BU179 (Accessed: 14 November 2020).

Reuters Staff (2017b) ‘Riots hit major bauxite mining hub in Guinea’, *Reuters*, 26 April. Available at: https://www.reuters.com/article/us-guinea-mining-idUSKBN17S0VE (Accessed: 11 November 2020).

Reuters Staff (2018) ‘SMB, Winning sign deal with Guinea for alumina refinery’, *Reuters*, 26 November. Available at: https://www.reuters.com/article/us-guinea-mining/smb-winning-sign-deal-with-guinea-for-alumina-refinery-idUSKCN1NV1ZT?edition-redirect=in (Accessed: 16 November 2020).

Reuters Staff (2019) ‘Russian ambassador sparks backlash with suggestion Guinea change constitution’, *Reuters*, 11 January. Available at: https://www.reuters.com/article/idUSKCN1P51SO (Accessed: 4 November 2020).

Rio Tinto (2020) *Our Business*. Available at: https://www.riotinto.com/about/business (Accessed: 16 November 2020).

Robinson, J. A., Torvik, R. and Verdier, T. (2006) ‘Political foundations of the resource curse’, *Journal of Development Economics*, 79(2), pp. 447–468.

Ross, M. L. (1999) ‘The political economy of the resource curse’, *World Politics*, 51, pp. 297–322.

Ross, M. L. (2015) ‘What have we learned about the resource curse?’, *Annual Review of Political Science*, 18, pp. 239–259.

Rusal (2020a) *Compagnie des Bauxite de Kindia*. Available at: https://rusal.ru/en/about/geography/kompaniya-boksitov-kindii/ (Accessed: 16 November 2020).

Rusal (2020b) *Dian Dian*. Available at: https://rusal.ru/en/innovation/development/dian-dian/ (Accessed: 16 November 2020).

Rusal (2020c) *Geography*. Available at: https://rusal.ru/en/about/geography/ (Accessed: 16 November 2020).

Rusal (2020d) *Nikolaev alumina refinery*, *Rusal*. Available at: https://rusal.ru/en/about/geography/nikolaevskiy-glinozemnyy-zavod/ (Accessed: 5 December 2020).

Sachs, J. D. and Warner, A. M. (1999) ‘The big push, natural resource booms and growth’, *Journal of Development Economics*, 59(1), pp. 43–76.

Sachs, J. D. and Warner, A. M. (2001) ‘The curse of natural resources’, *European Economic Review*, 45(4), pp. 827–838.

Sachs, J. and Warner, A. M. (1995) *Natural Resources Abundance and economic growth*. 5398.

Samb, S. (2017) ‘China to loan Guinea 20 billion USD to secure aluminum ore’, *Reuters*, 6 September. Available at: https://www.reuters.com/article/us-guinea-mining-china-idUSKCN1BH1YT (Accessed: 3 November 2020).

Sarmidi, T., Hook Law, S. and Jafari, Y. (2014) ‘Resource Curse: New Evidence on the Role of Institutions’, *International Economic Journal*. Routledge, 28(1), pp. 191–206.

Sarr, M. *et al.* (2011) ‘Resource curse and sovereign debt’, in Kolb, R. (ed.) *Sovereign Debt: From Safety to Default*. London: Wiley, pp. 51–62.

Savoia, A. and Sen, K. (2020) *The political economy of the ‘resource curse’ - A development perspective*. 123. Available at: https://www.wider.unu.edu/sites/default/files/Publications/Working-paper/PDF/wp2020-123.pdf (Accessed: 2 December 2020).

Sergey, F. (2010) ‘Russian companies: the rise of new multinationals’, *International Journal of Emerging Markets*. Emerald Group Publishing Limited, 5(3/4), pp. 307–332.

Singer, H. (1950) ‘Comments to the terms of trade and economic development’, *Review of Economics and Statistics*, 40(1), pp. 84–89.

SMB (2020) *SMB, an international consotrium in the bauxite adventure*. Available at: http://www.smb-guinee.com/en/ (Accessed: 16 November 2020).

Smith, S. (2018) *Guinea’s billion-dollar bauxite question*, *Mining Journal*. Available at: https://www.mining-journal.com/partners/partner-content/1347254/guinea’s-billion-dollar-bauxite-question (Accessed: 27 November 2020).

Stevens, P., Lahn, G. and Kooroshy, J. (2015) *The resource curse revisited*. London: Chatham House for the Royal Institute of International Affairs.

The Aluminum Association (2020a) *Primary Production*, *The Aluminum Association*. Available at: https://www.aluminum.org/industries/production/primary-production (Accessed: 4 November 2020).

The Aluminum Association (2020b) *Secondary Production*, *The Aluminum Association*. Available at: https://www.aluminum.org/industries/production/secondary-production (Accessed: 4 November 2020).

The New Humanitarian (2008) ‘Winners and loosers in Guinea’s bauxite industry’, *The New Humanitarian*, 9 June. Available at: https://www.thenewhumanitarian.org/report/78653/guinea-winners-and-losers-guinea’s-bauxite-industry (Accessed: 9 November 2020).

UNDP (2019) *Human Development Report 2019 Guinea*. Available at: http://hdr.undp.org/sites/all/themes/hdr_theme/country-notes/GIN.pdf (Accessed: 1 November 2020).

United States International Trade Commission (2017) *Aluminum: Competitive Conditions Affecting the U.S. Industry*. Washington, DC. Available at: https://www.usitc.gov/publications/332/pub4703.pdf (Accessed: 2 November 2020).

World Bank (2018) *Heavily Indebted Poor Country (HIPC) Initiative*, *The World Bank Group*. Available at: https://www.worldbank.org/en/topic/debt/brief/hipc (Accessed: 27 November 2020).

World Bank (2019) *Economy Profile Guinea - Doing Business 2020*, *The World Bank Group.* Available at: https://www.doingbusiness.org/content/dam/doingBusiness/country/g/guinea/GIN.pdf (Accessed: 23 November 2020).

World Bank (2020a) *Gross national income per capita 2019*, *The World Bank Group*. Available at: https://databank.worldbank.org/data/download/GNIPC.pdf (Accessed: 2 November 2020).

World Bank (2020b) *Guinea Overview*, *The World Bank Group.* Available at: https://www.worldbank.org/en/country/guinea/overview (Accessed: 20 September 2020).