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Mining taxation in Africa: What recent evolution in 2018?

Yannick Bouterige | Céline de Quatrebarbes
Bertrand Laporte

Abstract

The mining sector accounts for a significant share of tax revenues in many sub-Saharan African countries. Mining tax systems must then both attract investors and ensure sufficient revenues for governments. Following the increase in commodity prices in the second half of the 2000s, most African countries reformed their Mining Acts to increase the tax burden on mining companies. This study shows that this trend is still continuing in 2018. Mining royalty rates are rising, mineral resource rent taxes are reappearing and free equity for the States is increasing.

Pascal
Introduction

The extractive sector is of primary importance to African States. Of the 54 countries on the continent, 20 are considered rich in natural resources by the International Monetary Fund (IMF). These are countries whose natural resources account for more than 25% of total exports. All are sub-Saharan African countries: 7 export mainly oil and gas, 13 export mainly minerals: mostly gold, diamonds and precious stones. The significant weight of the extractive sector in these States raises the question of the taxation of these natural resources, which are non-renewable.

An innovative database on the taxation of mining industries in Africa has been put online on the Ferdi website, in partnership with Cerdi and ICTD. This database covers 21 sub-Saharan African countries over a period that varies according to the availability of information in each country but can go back to the 1980s. It was created on the basis of the tax legislation and regulations of each country, essentially the Income Tax Acts, Finance Acts and Mining Acts. It separates the general regime (applicable to all companies) from the mining regime (applicable only to holders of mineral rights for prospecting or exploitation on an industrial scale). It focuses on a single ore: gold.

The database covers the 12 main levies due by the holders of mineral rights who prospect for or exploit gold on an industrial scale: fixed fees, surface fees, mining royalties, mineral resource rent tax, corporate income tax (CIT), minimum tax, capital gains tax (CGT), withholding taxes on dividends, interest and services, free equities for the States, value added tax (VAT) and customs duties on imports. The database contains the information necessary to understand each of these levies: definition of the tax base, tax rates, exemption periods, etc. It allows a detailed analysis of African mining tax systems and their historical evolution over a long period.

After updating the database, this note presents the tax evolutions between 2016 and 2018:

(i) Mining royalty rates continue to increase since 2010.
(ii) Mineral resource rent taxes have been introduced in several countries.
(iii) Corporate income tax rates and minimum tax rates remained stable.
(iv) Free equity for the States are becoming more and more frequent.
(v) Average effective tax rates are increasing.

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1 The 20 African countries considered rich in natural resources by the International Monetary Fund are Angola, Botswana, Cameroon, Central African Republic, Chad, Republic of the Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Ghana, Guinea, Mali, Namibia, Niger, Nigeria, Sierra Leone, South Africa, Tanzania, Zambia and Zimbabwe. The report is based on the average export data from 2005 to 2010.
3 The Ferdi database on mining taxation in Africa is available at the following address: https://fiscalite-miniere.ferdi.fr/en
4 The authors would like to thank the Fondation pour les Etudes et Recherches sur le Développement International (Ferdi), the Centre d’Etudes et de Recherches sur le Développement International (Cerdi), the International Centre for Tax and Development (ICTD) and the Ecole Normale Supérieure de Lyon (ENS Lyon) for their technical and financial support.
5 The 21 African countries covered by the Ferdi database on mining taxation are Benin, Burkina Faso, Cameroon, Chad, Republic of the Congo, Democratic Republic of the Congo, Côte d’Ivoire, Gabon, Ghana, Guinea, Kenya, Madagascar, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Tanzania and Zimbabwe.
6 The database currently lists more than 1200 national legal texts.
Mining royalty

The mining royalty is an ad valorem tax that taxes the value of the ore when it is sold or exported. In principle, the mining royalty is the counterpart of the exploitation of the resource. Indeed, in most countries, substances present in the soil and subsoil, including under territorial waters, are by law the property of the State. The State therefore only grants exploitation to a mining company, granting it a mining right that is valid for a limited period of time, over a defined area and for a defined mineral. Legally, the mining royalty then appears as the counterpart of the private appropriation of a public resource. For the State, it is an important and relatively secure source of revenue, since it affects production, regardless of the profitability of the mine.

The base for the mining royalty requires the estimation of the value of the ore. Depending on the country, it can be defined in different ways. It can be estimated simply by gross turnover, often referred to as “market” value (Niger\(^7\), Tanzania\(^8\), Zimbabwe\(^9\)) or “commercial” value (Democratic Republic of the Congo\(^10\)) or “sales” value (Kenya\(^11\)). Several countries (Cameroon\(^12\), Chad\(^13\), Congo\(^14\)) use the value of the ore once it is extracted and stored, ready for shipment. Some countries (Mauritania\(^15\), Senegal\(^16\)) also refer to the “free on board (FOB)” value, when the products are intended for export. The value of the ore can otherwise be estimated by net turnover, when base reduction deductions are allowed. These may include, for example, “transport costs” and “refining costs” (Cote d’Ivoire\(^17\)) or “intermediate costs and charges” (Mali\(^19\)).

Mining royalty rates are generally differentiated according to minerals. Most countries classify minerals into several groups to apply different tax rates. In Benin, for example, the rates are 5% for precious stones (diamond, emerald, ruby, sapphire), 2% for precious metals (gold, platinum, silver, etc.) and 3% for base metals (lead, zinc, copper, etc.) and other mineral substances\(^19\). According to the information available on our sample (21 countries), in 2018, less than a fifth of the States (4 countries) applied the same rates to all minerals: South Africa, Ghana, Madagascar and Niger.

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\(^7\) Section 84 of Ordonnance n°93-16 du 2 mars 1993 portant loi minière, amended by Section 1 of Loi n°2006-26 du 9 août 2006, Republic of Niger.

\(^8\) Subsection 6 of Section 87 of Mining Act, 2010 (No. 14 of 2010), United Republic of Tanzania.

\(^9\) Schedule to Chapter VII concerning Section 37 of Finance Act, 1965 (No. 30 of 1965) [Chapter 23:04], Republic of Zimbabwe.


\(^12\) Paragraph 4 of Section 174 of Loi n°2016/017 du 14 décembre 2016 portant code minier, Republic of Cameroon.


\(^14\) Section 157 of Loi n°4-2005 du 11 avril 2005 portant code minier, Republic of the Congo.


\(^16\) Section 77 of Loi n°2016-032 du 8 novembre 2016 portant code minier, Republic of Senegal.

\(^17\) Section 4 of Ordonnance n°2014-148 du 26 mars 2014 fixant les redevances superficiaires et les taxes proportionnelles relatives aux activités régies par le code minier, Republic of Cote d’Ivoire.

\(^18\) Section 121 of Loi n°2012-015 du 27 février 2012 portant code minier, Republic of Mali.

\(^19\) Sections 1 and 85 of Loi n°2006-17 du 17 octobre 2006 portant code minier et fiscalités minières, Republic of Benin.
Mining royalty rates can be fixed, variable or progressive. Fixed rates are the most common. According to the information available on our sample (21 countries), more than three-quarters of the legislation (16 countries) had only fixed rates in 2018. However, there are more and more variable rates depending on mineral prices (Burkina Faso since 2011, Mauritania since 2012 and Côte d’Ivoire since 2014). They mainly concern gold, with rates between 3% and 6.5%. Progressive rates based on the mine’s profitability also exist. In South Africa, a formula is used to calculate a mining royalty rate between 0.5% and 5% for refined ores and between 0.5% and 7% for non-refined ores. In Niger, the law provides for three rates of 5.5%, 9% and 12% depending on operating income. In practice, however, it seems that only the minimum rate of 5.5% is applied.

**Graph 1 : Mining royalty rates, for gold, in 2018.**

Source: Authors’ calculations from the national legislation, based on information available for a sample of 21 sub-Saharan African countries.

**Between 2016 and 2018, 5 countries changed their mining royalty rates.** Rates are mostly on the rise. In the Democratic Republic of the Congo, a major reform of the Mining Act was undertaken in 2018. Rates have increased from 0.5% to 1% for ferrous metals, from 2% to 3.5% for non-ferrous metals, from 2.5% to 3.5% for precious metals and from 4% to 6% for precious stones. In Sierra Leone, the rates were already relatively high: 6.5% for precious stones, 5% for precious metals and 3% for other minerals. But the Extractive Industries

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23 Section 4 of Mineral and Petroleum Resources Royalty Act, 2008 (Act No. 28 of 2008), Republic of South Africa.
24 Section 1 of Loi n°2006-26 du 9 août 2006 amending Section 84 of Ordonnance n°93-16 du 2 mars 1993 portant loi minière, Republic of Niger.
Revenue Act, 2018, reintroduced a fourth group of minerals: gemstones with a commercial value of more than US$500,000 are now taxed at 8%\textsuperscript{27}. In Tanzania, some royalty rates were modified in 2017. For example, concerning gold, the rate rose from 4% to 6%\textsuperscript{28}. In Senegal, a new mining act was adopted in 2016. The ad valorem royalty has abandoned its single rate of 3% in favour of a multitude of rates differentiated according to minerals and their degree of refining. For gold, the rates are now 3.5% for refined ore in Senegal compared to 5% for crude or refined ore abroad\textsuperscript{29}.

**In Cameroon, ad valorem tax rates fell in 2017, but this decrease follows a significant increase two years earlier.** Indeed, in the Finance Act, 2015, Cameroon had considerably increased its rates: 20% for precious stones (diamond, emerald, ruby, sapphire), 15% for precious metals (gold, platinum, etc.) and 10% for base metals and other mineral substances\textsuperscript{30}. According to the information available on our sample (21 countries), never before had such high rates been introduced. The Finance Act, 2017, and the new Cameroonian Mining Act have therefore reduced them to levels that are still relatively high, but are nevertheless closer to the current rates: 8% for precious stones, 5% for precious metals, 10% for radioactive substances and their derivatives and 5% for base metals and other mineral substances\textsuperscript{31}.

### Mineral resource rent tax

The purpose of the mineral resource rent tax, as its name suggests, is to directly tax the rent, i.e. the net cash flow. In theory, this tax would be ideal because it would be economically neutral, i.e. it would not change either the decision to go into production or the production choice. Thanks to such a tax, it would even become possible to tax up to 100% of the rent. In practice, however, there are many uncertainties about the future operating conditions of a mine. It is therefore difficult to estimate ex ante the value of the rent accurately. A tax on pure rent is therefore almost impossible to implement.

Some countries are trying or have tried to introduce levies similar to a mineral resource rent tax. According to the information available on our sample (21 countries), in 2016, less than one fifth of the States (4 countries) had or had used such a levy in their legislation: Côte d’Ivoire, Ghana, Guinea and Zimbabwe. Also called additional profit tax, these levies specific to the mining sector are mainly aimed at capturing a larger share of the rent. These levies vary greatly from one country to another, and often pose significant practical difficulties.

The main question raised by the mineral resource rent tax is to define the tax base in a precise and operational way. Two risks exist for States: (i) define only literally the tax base without clearly specifying the method of calculation (Côte d’Ivoire between 1996 and 2012, Guinea between 1995 and 2011), (ii) define a complex calculation method, demanding in economic data, difficult to apply by the tax administration (Zimbabwe). In both cases,

\textsuperscript{27} Paragraph 1 of Schedule 1 of Extractive Industries Revenue Act, 2018, Republic of Sierra Leone.
\textsuperscript{28} Section 23 of Written Laws (Miscellaneous Amendments) Act, 2017 (No. 7 of 2017) amending Section 87 of Mining Act, 2010 (No. 14 of 2010), United Republic of Tanzania.
\textsuperscript{29} Section 77 of Loi n°2016-032 du 8 novembre 2016 portant code minier, Republic of Senegal.
whether the calculation method is not specified or is particularly complex, the rent tax is difficult to administer.

**Box 1 : Additional profits tax of Zimbabwe.**

In Zimbabwe, the additional profits tax is particularly complex. An entire schedule is devoted to it in the Income Tax Act. However, this appendix is written clearly enough, using mathematical formulas, to understand how it is calculated. This tax on additional profits is actually made up of two taxes, the amounts payable of which add up.

The rate of the first tax is determined by the formula: 

\[
\frac{(41.5 - T)}{(100 - T)}
\]

where \( T \) refers to the rate of income tax on mining companies. Today, the latter being set at 15\%,\(^{32}\) the rate of the first tax is therefore about 31.18\%\(^{33}\). The base of this first tax corresponds to the net cash flow for the year, increased by the accumulative net cash flows of previous years when they are negative. This accumulative negative net cash flow is revalued each year, with a fixed portion of 15\% and a variable portion based on inflation.

The rate of the second tax is set at 27.778\%. The base of this second tax is identical to the base of the first tax, with two exceptions. First, the net cash flow for the year is reduced by any payment of the first tax. Then, the fixed portion of the revaluation of the cumulative negative net cash flows is increased to 20\%.

**Until 2017, mineral resource rent taxes were gradually disappearing.** Ghana repealed its additional profit tax in 2001, when it introduced its new Internal Revenue Act\(^{34}\). Guinea waived its additional profit tax in 2011, with the entry into force of its new Mining Act\(^{35}\). Côte d’Ivoire did the same with its additional profit tax in 2014, when it adopted its new Mining Act\(^{36}\). According to the information available on our sample (21 countries), Zimbabwe was therefore the last country in 2017 to retain an additional profits tax in its Income Tax Act\(^{37}\). However, 2018 saw a resurgence of rent taxes.

**In 2018, 3 new countries introduced levies into their legislation that could be similar to a mineral resource rent tax.** The Democratic Republic of the Congo has created a special tax on excess profits. The purpose of this tax is to overtax mining companies that may underestimate mineral prices in their feasibility studies. A mining company may (i) have an interest in underestimating prices in its feasibility study in order to overestimate the tax burden it will have to bear throughout the mining project, but also (ii) have serious difficulties in anticipating future changes in mineral prices. Sierra Leone has introduced a mineral resource rent tax that is similar to the additional profits tax in Zimbabwe. Chad has also introduced a rent tax. Very simple in its calculation, it is, however, far from the principle of a rent tax by applying to mining companies whose turnover significantly exceeds the deductible corporate tax expenses.

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\(^{32}\) Part 2 of Schedule to Chapter 1 of Finance Act, 1965 (No. 30 of 1965) [Chapter 23:04], Republic of Zimbabwe.

\(^{33}\) \((41.5 - 15) / (100 - 15) = 53/170 = 31.18\%\).

\(^{34}\) Section 168 of Internal Revenue Act, 2000 (Act 592), Republic of Ghana.


\(^{37}\) Section 33 and Schedule 23 of Income Tax Act, 1967 (No. 5 of 1967) [Chapter 23:06], Republic of Zimbabwe.
Box 2 : Special tax on excess profits of Democratic Republic of the Congo.

In the Democratic Republic of the Congo, a special tax on excess profits was introduced in 2018 as part of the major reform of the Mining Act. The tax is only due when the prices are 25% higher than those provided for in the feasibility study. Indeed, according to the law, excess profits appear when “the prices of commodities increase exceptionally, by more than 25% compared to those included in the feasibility study” of the mining project. The tax rate is set at 50% and the base defined as the “difference between the amount of the gross operating income for the accounting year less the amount of the gross operating income generated by the erroneous feasibility study of the mining project for that same year, the latter amount increased by 25%”. It is also specified that “for the purpose of determining excess profits, research and development expenses are not deductible. Similarly, the allocation of previous deficits is prohibited”. Excess profits subject to the special tax are not subject to income tax.

Box 3 : Mineral resource rent tax of Sierra Leone.

In Sierra Leone, a mineral resource rent tax was created in 2018 by the Extractive Industries Revenue Act. The tax rate is determined by the formula: \((40 – \text{Income Tax Rate}) / (100 – \text{Income Tax Rate})\), where Income Tax Rate refers to the corporate income tax rate on mining companies. This formula is very similar to the one used in Zimbabwe. Today, with a income tax rate on mining companies set at 30%, the rent tax rate is therefore around 14.29%. The tax base corresponds to “accumulated net receipts”, a rather complex concept that involves several other concepts, such as “gross receipts”, “net receipts”, “deductible expenditure”, “net expenditure” and “accumulative net expenditure”. These different notions are defined at length, but no mathematical formula is given to allow them to be calculated unambiguously, which makes it difficult to understand the exact base.

Box 4 : Mineral resource rent tax of Chad.

In Chad, the new Mining Act introduced a mineral resource rent tax in 2018. The tax rate is set at 50% and the base defined as the “difference between turnover, on the one hand, and operating expenses, including royalties, increased by fifty percent, on the other hand”. The definition of the base is illustrated by the formula: \[ R – (D + M) \], where R represents the turnover, D represents the expenses deductible from the corporate income tax base and M corresponds to the 50% increase in deductible expenses: \( M = D \times 50\% \). The Chadian rent tax is not deductible from the corporate income tax base. On the other hand, mining companies are exempt from rent tax when its amount is less than the withholding tax on the distribution of dividends. Conversely, mining companies are exempt from withholding tax on dividends when the amount is less than the rent tax.
These three new levies are better defined than the old additional profit taxes that existed in Cote d’Ivoire or Guinea. In Chad, the rent tax is very simple to calculate and does not require more information than that already required for the calculation of corporate income tax. In the Democratic Republic of the Congo, the special tax on excess profits is slightly more complex to calculate since it requires additional information. For each year, it is first necessary to compare the effective average selling price of the ore with the average selling price forecast in the feasibility study. Then, if this effective selling price is more than 25% higher than the selling price initially forecast, it is necessary to subtract the gross operating income forecast by the feasibility study, increased by 25%, from the actual gross operating income for the year in order to obtain the tax base. The regulations have therefore been revised to allow the tax authorities to benefit from all the necessary information. Holders of mining rights are now required to “file a copy of the feasibility study of the mining project with the tax administration before the project actually goes into production”\textsuperscript{46}. Only the rent tax introduced in Sierra Leone, although very precisely defined in the law, appears difficult to calculate without an implementing text or calculation method.

**Corporate income tax and minimum tax**

**Corporate income tax is an income tax that taxes the profits of companies.** Its base corresponds to the difference between revenues and deductible expenses. Deductible expenses include actual expenses (operating costs, financial expenses, deductible taxes) and fictitious expenses (depreciation, loss carryforwards). Corporate income tax rates have declined in recent decades. According to the information available on our sample (21 countries), all States currently apply corporate income tax rates between 25% and 35% for the general regime, with the exception of Madagascar whose rate is 20\%\textsuperscript{47}. In contrast, for the mining regime, the laws of three countries may result in rates that fall outside this range. South Africa proposes a formula to calculate a progressive rate between 0\% and 34\%\textsuperscript{48}. Madagascar has three rates of 25\%, 35\% and 40\% that increase with the internal rate of return (IRR) of industrial gold mines only\textsuperscript{49}. Finally, Zimbabwe is reducing its rate to only 15\% for holders of mining leases\textsuperscript{50}.

\textsuperscript{46} Section 530 bis of Décret n°038/2003 du 26 mars 2003 portant règlement minier, amended by Décret n°18/024 du 8 juin 2018, Democratic Republic of the Congo.
\textsuperscript{47} Section 2 of Loi n°2012-021 du 17 décembre 2012 portant loi de finances pour 2013 amending Section 01.01.14 of Loi portant code général des impôts, Republic of Madagascar.
\textsuperscript{48} Paragraph 3 of Schedule 1 of Rates and Monetary Amounts and Amendment of Revenue Laws Act, 2017 (Act No. 14 of 2017), Republic of South Africa.
\textsuperscript{49} Section 1 of Loi n°2005-022 du 17 octobre 2005 amending Section 48 of Loi n°2001-031 du 8 octobre 2002 établissant un régime spécial pour les grands investissements dans le secteur minier malagasy, Republic of Madagascar.
\textsuperscript{50} Schedule to Chapter 1 of Finance Act, 1965 (No. 30 of 1965) [Chapter 23:04], Republic of Zimbabwe.
Corporate income tax rates may be accompanied by a minimum tax. The minimum tax is based on the turnover of companies. It concerns mainly French-speaking African countries, although similar provisions may exist in English-speaking African countries. Its objective is to secure the State’s revenue. It is due annually, at the same time as corporate income tax. However, it is often paid in quarterly instalments. If the corporate income tax is lower than the minimum tax, the company only pays the minimum tax. Otherwise, it pays the balance, i.e. the difference between the corporate income tax and the minimum tax. According to the information available on our sample (21 countries), concerning large companies, States apply minimum tax rates between 0.5% and 2.5% in 2018.
Graph 4: Minimum tax rates, concerning general regime, in French-speaking African countries, in 2018.

Source: Authors’ calculations from the national legislation, based on information available for a sample of 14 French-speaking African countries.

Guinea is the only country to have recently changed its rates. The Finance Act, 2018, reduced the corporate income tax rate from 35% to 25% for the general regime. However, telephone companies, banks and insurance companies, as well as companies importing, storing and distributing petroleum products remain taxed at 35% of their profits. Holders of mineral rights were already subject to a rate of 30%, which remains unchanged. The Finance Act, 2018, also halved the minimum tax rate from 3% to 1.5%. However, this last measure will be cancelled by the Finance Act, 2019.

Free equity for the State

States may require equity investment in mining companies. Generally, Mining Acts provide that the holder of the mining right must create a company under national law in which the State participates, free of charge, usually to 10%. This free shareholding may not be diluted, even in the event of a capital increase. An additional participation of the State is possible, but this is then acquired under normal conditions, i.e. in cash. Where this additional participation is provided for, however, it may not exceed a percentage of the capital set by law.

Becoming a shareholder not only allows the State to have access to information but also to receive dividends. It is a way to increase the part of the rent it receives on a mining project. However, unlike the payment of taxes, which is mandatory, the payment of dividends is a discretionary decision taken by the company’s general meeting. In order to secure its income, some countries therefore provide for the payment of priority dividends.

53 Section 11 of Loi L/2017/059/AN du 12 décembre 2017 portant loi de finances pour l’année 2018 amending Section 244 of Loi portant code général des impôts, Republic of Guinea.
54 Section 14 of Loi L/2018/069/AN du 26 décembre 2018 portant loi de finances pour l’année 2019 amending Section 244 of Loi portant code général des impôts, Republic of Guinea.
More and more States are demanding to enter into the capital of mining companies. According to the information available on our sample (21 countries), less than half of the States (10 countries) planned free participation in 2008, specifying a rate in the law. Chad also mentioned the possibility of participation, but no rate was set. The Chadian Mining Act only stipulated that, in the event of participation, the nature and modalities of this participation should be determined in the mining agreement. By 2018, more than three-quarters of the States in the sample (16 countries) require such non-contributory participation.

**Graph 5 : Number of countries requiring free equity for the State in the capital of industrial gold mining companies, between 2008 and 2018.**

Source: Authors’ calculations from the national legislation, based on information available for a sample of 21 sub-Saharan African countries.

In addition, the required rates of non-contributory participation are increasing. The free equity for the State in the company’s capital is generally 10%. Until 2016, only two countries were exceptions: the Democratic Republic of the Congo asked for only 5%, while Guinea set differentiated rates according to minerals, which can rise to 15%. In recent years, several countries that have inserted or modified their participation have set rates above 10%. In Tanzania, the amendment of the Mining Act in 2017 introduced a 16% free equity. In Chad, the new Mining Act that came into force in 2018 requires a non-contributory participation of 12.5%. Finally, in the Democratic Republic of the Congo, the major reform of the Mining Act in 2018 created a progressive participation: the mining company must first transfer 10%

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55 In 2008, the 10 countries requiring free equity for the State were Benin, Burkina Faso, Republic of the Congo, Democratic Republic of the Congo, Cote d’Ivoire, Ghana, Guinea, Mali, Niger and Senegal.
57 In 2018, the 16 countries requiring free equity for the State are Benin, Burkina Faso, Cameroon, Chad, Republic of the Congo, Democratic Republic of the Congo, Cote d’Ivoire, Gabon, Ghana, Guinea, Kenya, Mali, Mauritania, Niger, Senegal and Tanzania.
60 Section 9 of Written Laws (Miscellaneous Amendments) Act, 2017 (No. 7 of 2017), amending Section 10 of Mining Act, 2010 (No. 14 of 2010), United Republic of Tanzania.
of its shares to the State when it grants its mining right, to which is then added an additional 5% each time the right is renewed. In addition, at least 10% of the capital must be held by natural persons of Congolese nationality.

Conclusion

Recent legislative evolutions are leading to an increase in the taxes payable by industrial mining companies. Indeed, most of the tax measures adopted between 2016 and 2018 are in this direction. Mining royalty rates have been increased in the Democratic Republic of the Congo, Senegal, Sierra Leone and Tanzania. Levies similar to a mineral resource rent tax have been introduced in Chad, Democratic Republic of the Congo and Sierra Leone. The free equity for the States are more numerous and their rates are rising in Chad, Democratic Republic of Congo and Tanzania. The only significant decrease is the previously extremely high ad valorem royalty rates that Cameroon introduced in 2015.

However, it is difficult to compare tax systems solely on the basis of their tax rates. The total tax burden of a company is measured by the sum of several taxes, some of which are interdependent. For example, mining royalties, surface royalties and fixed fees are generally deducted from the corporate income tax base. The payment of dividends to shareholders, including the State, depends on the remaining after-tax profit. Finally, the amount of taxes payable only makes sense in relation to the amount of investments made and profits made. In order to consider all these factors, it is relevant to calculate an average effective tax rate.

The average effective tax rate (AETR) of a mining project is the government’s share of the mineral resource rent. It is calculated as the discounted sum of government levies divided by the discounted sum of net cash flows before taxes. The level of the AETR depends, of course, on the tax system, but also on the economic conditions of the mine, such as production costs and ore prices. Indeed, under identical economic conditions, a viable mine in one country may not be viable in another country with a heavier tax system. Similarly, an economically viable mine for a given ore price may become loss-making if prices fall. The advantage of the AETR is that it allows a tax burden to be synthesized, well beyond nominal tax rates alone. It therefore makes it possible to compare tax systems, even very different ones, both spatially (between countries) and temporally (within the same country).

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Graph 6: Level of average effective tax rates in 2018 and their variation between 2016 and 2018.

Source: Authors’ calculations from the national legislation, based on information available for a sample of 21 sub-Saharan African countries.

The cash flow model used to obtain these results is the mineral resource rent sharing model developed by Ferdi. It models a mine representative of African open-pit gold mines with an average grade (3g/t). This mine produces 1.6 million ounces of gold over a 13-year mine lifetime. The tax system applied to this mine is the one in force under each country’s legislation in 2018 and for a fixed gold price of $1400/oz. It is composed of 8 levies: fixed fees, surface fees, mining royalty, corporate income tax, minimum taxes, withholding tax on interest, withholding tax on dividends and free equity for the State. Due to the difficulties they create, mineral resource rent taxes are not taken into account, which is a limitation to the comparison of the AETRs.

The calculation of AETRs confirms the increase in the tax burden on mining companies between 2016 and 2018. According to the information available on our sample (21 countries), the AETRs in 2018 are between 27.0% and 52.2%. Between 2016 and 2018, the average of the AETRs increased from 42.7% to 43.8% and the median from 41.5% to 46.2%. More than half of the States (11 countries) experienced an increase in their AETR, while decreases are rare (3 countries). By removing small variations (between plus or minus 1 point of AETR), the AETRs of 5 States were truly marked by a significant increase. And only Cameroon’s AETR experienced a significant decline. Since 2015, the country had by far the highest AETR (63.0%, compared to 51.1% for Guinea). By reducing the excessive rate of its ad valorem royalty, which rose from 15% to 5% for gold in 2016, Cameroon is no longer the country that taxes mining companies the most in 2018.

63 The results of the simulations carried out using Ferdi’s mineral resource rent sharing model are available at the following address: https://fiscalite-miniere.ferdi.fr/simulations
64 Between 2016 and 2018, the 11 countries whose simulations lead to an increase in their AETR are Tanzania (+11.3 percentage points), Chad (+9.6 points), Kenya (+6.3 points), Democratic Republic of the Congo (+4.8 points), Senegal (+2.6 points), South Africa (+0.8 point), Niger (+0.2 points), Guinea (+0.1 point), Cote d’Ivoire (+0.07 point), Gabon (+0.02 point) and Madagascar (+0.01 point).
65 Between 2016 and 2018, the 3 countries whose simulations lead to a decrease in their AETR are Cameroon (-12.1 percentage points), Burkina Faso (-0.02 point) and Sierra Leone (-0.01 point).
The largest increases in AETRs are in Tanzania, Chad, Kenya, Democratic Republic of the Congo and Senegal. These 5 countries all reformed their Mining Acts between 2016 and 2018. Senegal’s AETR was already among the highest in 2016 (47.8% in 2016 and 50.4% in 2018), while the AETRs of the other 4 countries were below the sample average in 2016. For the Democratic Republic of the Congo and Kenya, the increase in the AETR can be seen as a simple catch-up. These countries are in the average of the AETRs in 2018. In contrast, Chad and Tanzania are now the two countries that tax mining companies the most (with AETRs of 52.2% and 51.7% respectively). In the case of Chad, by applying the mineral resource rent tax as provided for in the new Mining Act, the AETR would even rise to 76.0%.
### Appendix: Main tax laws in force in 2018

<table>
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<th>Country</th>
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<th>Mining regime</th>
</tr>
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<tr>
<td>Burkina Faso</td>
<td><strong>General Taxation</strong>&lt;br&gt;Loi n°058-2017/AN du 20 décembre 2017 portant code général des impôts au Burkina Faso</td>
<td><strong>Mining Act</strong>&lt;br&gt;Loi n°036-2015/CNT du 26 juin 2015 portant code minier du Burkina Faso&lt;br&gt;<strong>Mining Regulations</strong>&lt;br&gt;Décret n°2017-0036/PRES/PM/MEMC/MATDSI/MINEFID/MEEVCC/MCIA du 26 janvier 2017 portant gestion des titres miniers et autorisations&lt;br&gt;<strong>Mining Agreement</strong>&lt;br&gt;Décret n°2017-0035/PRES/PM/MEMC/MINEFID/MCIA/MATDSI/MJFIP/MFPTPS/MEECVV du 26 janvier 2017 portant adoption d’un modèle-type de convention minière&lt;br&gt;<strong>Mining Taxes</strong>&lt;br&gt;Décret n°2017-0023/PRES/PM/MEMC/MINEFID du 23 janvier 2017 portant fixation des taxes et redevances minières</td>
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66 In Gabon, a new Mining Act was adopted in 2018 (Loi n°037/2018 du 11 juin 2019), but it did not enter into force until 2019.
<table>
<thead>
<tr>
<th>Country</th>
<th>General regime</th>
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</table>
| Ghana  | – **Income Tax**  
Income Tax Act, 2015 (Act 896), amended  
– **Value Added Tax**  
Value Added Tax Act, 1998 (Act 546), amended  
– **Health Insurance**  
National Health Insurance Act, 2012 (Act 852), amended | – **Mining Act**  
Minerals and Mining Act, 2006 (Act 703), amended by Act 794 et Act 900  
– **Mining Regulations**  
Minerals and Mining (General) Regulations, 2012 (LI 2173) |
| Guinea | – **General Taxation**  
– **Finance Act, 2017**  
Loi L/2016/066/AN du 19 décembre 2016 portant loi de finances initiale pour l’année 2017  
– **Finance Act, 2018**  
Loi L/2017/059/AN du 12 décembre 2017 portant loi de finances pour l’année 2018  
– **Amending Finance Act, 2018**  
Loi L/2018/047/AN du 3 septembre 2018 portant loi de finances rectificative pour l’année 2018 | – **Mining Act**  
– **Mining Regulations**  
Décret D/2014/012/PRG/SGG du 17 janvier 2014 portant gestion des autorisations et des titres miniers  
– **Mining Agreement**  
Décret D/2014/015/PRG/SGG du 17 janvier 2014 portant adoption d’un modèle de convention minière type  
– **Fixed Fees and Surface Fees**  
| Kenya  | – **Income Tax**  
Income Tax Act, 1973 (No. 16 of 1973) [Chapter 470], amended  
– **Value Added Tax**  
Value Added Tax Act, 2013 (No. 35 of 2013), amended  
– **Finance Act, 2017**  
Finance Act, 2017 (No. 15 of 2017)  
– **Finance Act, 2018**  
Finance Act, 2018 (No. 10 of 2018) | – **Mining Act**  
Mining Act, 2016 (No. 12 of 2016) |
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<td>Mali</td>
<td>– <strong>General Taxation</strong>&lt;sup&gt;67&lt;/sup&gt; Loi n°06-067/AN du 29 décembre 2006 portant code général des impôts, amended</td>
<td>– <strong>Mining Act</strong>&lt;sup&gt;67&lt;/sup&gt; Loi n°2012-015 du 27 février 2012 portant code minier</td>
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<td>– <strong>Finance Act, 2018</strong> Loi n°2017-073 du 26 décembre 2017 portant loi de finances pour l’exercice 2018</td>
<td>– <strong>Mining Agreement</strong> Décret n°2012-490/PM-RM du 7 septembre 2012 portant approbation de la convention d’établissement-type pour la prospection, la recherche et l’exploitation des substances minérales</td>
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<td>– <strong>Amending Finance Act, 2017</strong> Loi n°2017-024 du 24 octobre 2017 portant loi de finances rectificative pour l’année 2017</td>
<td>– <strong>Mining Agreement</strong> Loi n°2012-012 du 12 février 2012 réglementant les conventions minières et approuvant la convention mière type</td>
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<sup>67</sup> In Mali, a new Mining Act was adopted in 2019 (Ordonnance n°2019-022/P-RM du 27 septembre 2019).

<sup>68</sup> In Mauritania, a new General Tax Act was adopted in 2019 (Loi n°2019-018 du 29 avril 2019).
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</table>
| Senegal     | – **General Taxation**  
Loi n°2012-31 du 31 décembre 2012 portant code général des impôts, amended  
– **Finance Act, 2017**  
Loi n°2016-35 du 23 décembre 2016 portant loi de finances pour l’année 2017  
– **Finance Act, 2018**  
Loi n°2017-35 du 21 décembre 2017 portant loi de finances pour l’année 2018  
– **Amending Finance Act, 2018**  
Loi n°2018-024 du 6 juillet 2018 portant loi de finances rectificative pour l’année 2018 | – **Mining Act**  
Loi n°2016-032 du 8 novembre 2016 portant code minier  
– **Mining Regulations**  
Décret n°2017-459 du 20 mars 2017 fixant les modalités d’application de la loi n°2016-032 du 8 novembre 2016 portant code minier |
| Sierra Leone | – **Income Tax**  
Income Tax Act, 2000 (No. 8 of 2000)  
– **Goods and Services Tax**  
Goods and Services Tax Act, 2009 (No. 6 of 2009)  
– **Finance Act, 2017**  
Finance Act, 2017 (No. 1 of 2017)  
– **Finance Acts, 2018**  
Finance Act, 2018 (No. 2 of 2018)  
Finance (Amendment) Act, 2018 (No. 12 of 2018) | – **Mining Act**  
Mines and Minerals Act, 2009 (No.12 of 2009), amended  
– **Extractive Industries Revenue Act**  
Extractive Industries Revenue Act, 2018 |
| Tanzania    | – **Income Tax**  
Income Tax Act, 2004 (No. 11 of 2004), amended  
– **Value Added Tax**  
Value Added Tax Act, 2014 (No. 5 of 2014), amended  
– **Finance Act, 2017**  
Finance Act, 2017 (No. 4 of 2017)  
– **Finance Act, 2018**  
Finance Act, 2018 (No. 4 of 2018) | – **Mining Act**  
Mining Act, 2010 (No. 14 of 2010)  
– **Extractive Industries Act**  
Tanzania Extractive Industries (Transparency and Accountability) Act, 2015 (No. 23 of 2015) |
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