IDEAS FOR IMPROVING **MINERAL TAXATION** IN LATIN AMERICA AND THE CARIBBEAN

Opportunities for Sustainable Development

IGF INTERGOVERNMENTAL FORUM on Mining, Minerals, Metals and Sustainable Development

IDB

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PREFACE

Mining has been—and will continue to be—one of the fundamental drivers of global economic development. Mineral resources have fueled technological advances across a variety of sectors, whether as inputs for agriculture or the production of essential communications components, as sources of energy, or as a pillar for exchanging knowledge and research. Through taxation and royalties, the rents generated from these resources have financed critical infrastructure for the provision of public services, as well as the expansion of education and health systems and, in some countries, urban and rural development.

This transformative impact is also evident in the Latin American and Caribbean (LAC) region. To sustain and enhance this phenomenon, the region needs a mining sector that is productive, competitive, and capable of sustainable growth, generating positive spillover effects to the rest of the economy. Achieving this requires a critical review of current conditions in the sector, particularly the factors that underpin its development. This publication proposes measures that will support more efficient, equitable, and sustainable growth in the mining sector and the broader economy.

Specifically, it addresses three key debates associated with three stages of mining projects:

I. How can competitive bidding processes help to maximize fiscal revenue and improve the allocation of mining areas?
II. How can greater economic efficiency be achieved in the cost structure of mining projects?
III. What share of project revenues should the State receive, when these projects are largely owned by foreign private companies?

This publication tackles these questions through its three chapters. The first describes tax incentives and their role in attracting foreign direct investment, highlighting the need to reassess existing schemes and implement policies that balance private interests with public benefit in the development of mining projects. The second examines the institutional framework for granting mining rights and proposes the adoption of competitive bidding arrangements as a means of boosting sector participation, leveling the competitive playing field, and selecting projects with the highest levels of production cost efficiency. The third chapter focuses on the balance between private interests and public benefits once projects have been selected, through the State's participation in mining rents via royalty systems.

Although these three pillars can be addressed separately, their solutions are interdependent and integral to institutional design. Successful and sustainable sectoral development over time requires a coherent mining policy, supported by strengthened and modernized institutions capable of adapting to the most pressing competitiveness and equity challenges in the 21st century. We hope that this publication will meet these objectives and enrich the debate surrounding sector development, thus supporting stronger economic growth in the region.

INTRODUCTION

Technological innovation drives economic growth and increases the demand for minerals, particularly in sectors such as telecommunications, mobility, and power generation. This demand has raised the pace of productive expansion in mining countries. The burgeoning exploration and exploitation of strategic minerals—lithium, graphite, cobalt, nickel, manganese, rare earths, etc.—is fueled by investment from countries such as China, Germany, and the United States, France, and Ireland. Many of these resources can be found in Latin American and Caribbean (LAC) countries as well.

According to the United States Geological Survey (USGS),[1] Chile, Mexico, and Peru accounted for 57 percent of total world molybdenum production in 2022, while Brazil, Colombia, Cuba, the Dominican Republic, and Guatemala produced 8 percent of nickel in the same year. Brazil alone accounted for 93 percent of the world's niobium supply, and Brazil, Colombia, the Dominican Republic, Jamaica, and Venezuela generated 9.5 percent of global bauxite production (BMF, 2024; Energy Institute, 2024; IEA, 2023).

Harnessing this abundance of resources constitutes a key objective for these countries, as timely action can lead to increased investment and, consequently, higher revenues associated with the allocation of mining licenses for the exploration and exploitation of these strategic minerals. GIZ (2023) analyzes the economic implications of the clean energy transition for government revenue in mineral resource-rich countries, estimating that LAC countries receive gross annual revenues of US$59.562 billion, underscoring the importance of the region's mining sector for revenue.

Harnessing mining activity, however, requires that countries tackle the challenges associated with the production of critical minerals (IEA, 2021; IGF, 2022a, 2024). This implies analyzing and addressing shortcomings in mining governance, particularly regarding the effective monitoring of investors' activities. In the past, mining has failed to meet government revenue expectations for several reasons, such as tax base erosion and profit shifting, excessive fiscal incentives, and a lack of administrative capacity for effectively supervising tax collection. These factors have limited the ability of countries with abundant natural resources to maximize the fiscal benefits of mining (Homer-Dixon, 1995; Hauge and Ellingsen, 1998; Auty, 2004, 2001). At the same time, difficulties in managing mining chains mean that it is not always possible to accurately identify a country's natural resources or determine their value (Bastida and Bustos Niño, 2016).

The lack of a mining agency responsible for allocating and awarding licenses and monitoring activity makes it more difficult to obtain geological information for identifying exploitable resources (J.P. Morgan and Economic Impact, 2024). As a result, the efforts of geological agencies are hindered. In Brazil, for example, although the mining agency has existed since the 1990s, its mandate did not include the systematic identification of all relevant areas, many of which remained under the control of the geological institute or companies privatized in the 1970s and 1980s. In Colombia, this role was only assigned to a specialized entity in 2018.[2]

Similarly, the absence of a centralized institutional framework has had consequences for the efficient allocation of licenses. Countries such as Guyana and Suriname have implemented negotiation models that focus on securing material benefits or developing relations with ruling nations.[3]

This publication is inspired by Readhead et al. (2023), marking the beginning of collaborative efforts between the Intergovernmental Forum on Mining, Minerals, Metals, and Sustainable Development (IGF) and the Inter-American Development Bank (IDB). It provides a starting point for reassessing how countries can optimize the fiscal benefits of their mineral resources and offers recommendations tailored to the LAC environment. A brief outline of the proposals included in each chapter follows.

The first proposal, aimed at promoting sectoral development that contributes to economic growth, is to review tax incentives designed to foster investment. The main objective of these incentives is usually to attract capital, although they can sometimes be broader in scope. This publication reviews the tax structure and investment incentives offered to investors in Argentina, Guyana, Mexico, and Peru, finding that such incentives have a significant impact on revenue and should be reviewed to ensure their cost-effectiveness, not only in terms of attracting and retaining investment, but also in terms of striking a balance between private returns and the tax burden (including royalties).

The second one seeks to make the allocation of mining licenses more effective and transparent through open and competitive bidding processes for the granting of mining exploitation rights, as explored in the cases of Brazil, Colombia, and Suriname.[4] Unlike the traditional "first-come, first-served" model, this approach allows the State to set conditions aligned with its public policy objectives, while selecting bidders with strong technical and financial capabilities, thereby achieving greater productive cost efficiency. Well-designed bidding processes can strengthen the State's regulatory role, improve the management of mineral resources, and increase fiscal revenue through greater participation by potential investors and higher project-level efficiency, while also generating important non-fiscal benefits. To implement them, however, adequate institutional capacity is required to carry out resource exploration, identify areas, measure reserves, set conditions, select proposals, and monitor projects.

The third and final proposal involves reassessing mining royalties. Royalties represent the State's share of mining rents and constitute the compensation received for the exploitation and commercialization of subsoil resources. With few exceptions, mining royalties in the region are calculated as a fixed percentage of sales, yet this approach prevents any adjustment of the State's share in response to price cycles, whether in moments of high demand or in critical situations. This curtails not only the social benefits that might result from higher mining activity but also the sector's sustainability over time as a source of economic development. The growing need for countries to strike a balance between private interests and social returns calls for a reassessment and the adoption of mechanisms better suited to this objective, such as variable-rate or hybrid royalty systems, to enhance sustainability and introduce progressivity into their design (IGF, 2022b). Accordingly, the proposal seeks to strengthen the institutional framework for the taxation of mining activities, not only by reexamining royalty systems but also by developing a sophisticated, modern institutional framework that addresses the sector's development needs and thereby contributes to broader economic growth.

These three proposals have been selected considering the evolving dynamics observed in government and legislative management in the LAC countries, including efforts to improve the efficiency and competitiveness of mining governance and to capitalize on the new opportunities arising from the growing global demand for minerals in support of more sustainable economic growth. These ideas are preliminary, and further actions will be required to assess, refine, and incorporate them, particularly within a broader process of institutional strengthening. Nonetheless, they reveal the status of mining legislation in the LAC region and the progress that has been made, with a particular focus on the challenges faced in developing the sector.

The dialogue does not end here. Both the mining sector and society in general will continue to evolve in diverse and innovative ways, potentially requiring governments to adapt their systems to distribute economic benefits more effectively. The IGF and IDB are committed to helping LAC countries tackle these challenges, thus helping to preserve opportunities and benefits for all.

Through their technical assistance programs, both the IGF and IDB help to generate new policy ideas and an inclusive debate that brings in all stakeholders. The objective of these efforts is clear: to transform mineral wealth into concrete results that drive sustainable development.

CHAPTER 1.
MINING TAX INCENTIVES IN LATIN AMERICA AND THE CARIBBEAN: AN EVALUATION OF FOUR COUNTRIES

1.1. Introduction[1]

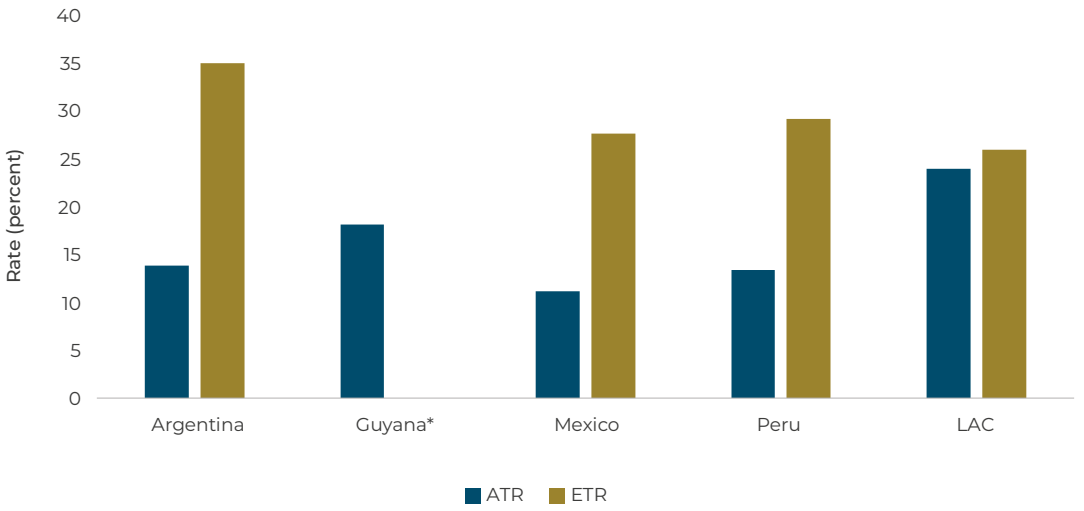
Countries in Latin America and the Caribbean (LAC) have significant mining activity, particularly in minerals essential for the energy transition and communication technologies, such as copper, lithium, silver, gold, and platinum, among others. To promote this activity and create conditions conducive to its international competitiveness, LAC countries have developed tax regimes that consider the specific characteristics of the sector, including large upfront, long-term investments where mineral extraction is economically viable, as well as high levels of uncertainty related to geology, market conditions, and the development of new technologies. Tax incentives—defined as any special tax provision that grants preferential treatment, relative to the general tax code, to qualifying investment projects or firms (IMF et al., 2015)—have played a role in the development of the mining sector. The main rationale for providing incentives has been to stimulate investment—particularly foreign direct investment (FDI)—as an engine of sustainable sector growth. In exchange for these concessions, countries expect project development to contribute to local capital formation (sometimes at the community level), new formal employment opportunities, and technology acquisition, in addition to potential spillover effects on other economic activities through production linkages, thereby supporting overall economic growth.

However, these expectations are rarely met, as the range of possible agreements that can balance the interests of the companies against social benefits is limited by market volatility, information asymmetries between the parties, and the strength of institutions, as well as the fact that mining activity is specific to the geography and geology of the resource-receiving country.[2]

This chapter provides an overview of the tax incentives granted to large-scale mining activities in four LAC countries:[3] Argentina, Guyana, Mexico, and Peru. Mining companies in these countries operate under tax regimes that are more favorable to their activities than those applied to other sectors and to comparable firms in other countries. Such incentives commonly include tax credits and exemptions for exploration

and development costs, exemptions or reductions in trade-related taxes, and preferential withholding tax treatment on outbound payments. Effective tax rates (ETRs) on the mining sector are significantly lower than average tax rates (ATRs) in these countries and in the region (Figure 1.1). This marked divergence highlights the importance of examining the fiscal provisions that determine these outcomes and, consequently, influence mining activities in these countries. A clear understanding of these provisions enables a more informed discussion on the rational, evidence-based use of tax incentives and other fiscal instruments, which is particularly relevant considering growing fiscal pressures and unmet social demands in the post-pandemic context.

Figure 1.1. Average Mining Tax Rate and Effective Corporate Tax Rates



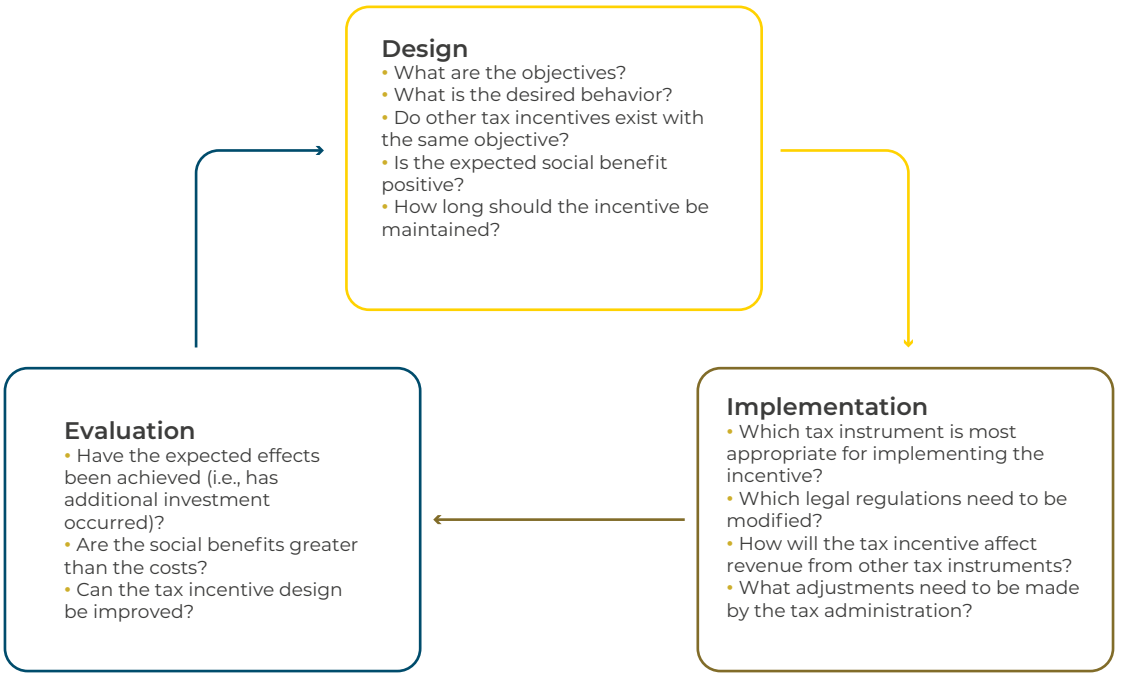
Source: Authors' elaboration based on Mintz, Bazel, and Reyes-Tagle (2023) and OECD (n.d.).

Notes: * ETR data unavailable for Guyana. The ATR is the average tax rate on mining calculated in the first study, while the ETR is taken from the latter database. LAC averages are calculated based on the data for each country from each source.

Achieving an appropriate balance between attracting and facilitating investment, on the one hand, and securing a share of mining rents that maximizes societal benefits, on the other, is not an easy task for governments. Effectiveness is associated with higher mining activity and increased investment, while efficiency implies greater net social benefits. In both cases, firms' economic behavior (i.e., an incentive problem), the magnitude and rigidity of administrative and compliance costs, and the presence of budgetary rules governing resource allocation—including the accounting of tax expenditures (CIAT, 2011)[4]—are key elements in determining

private and social benefits. Figure 1.2 lists several of the factors to be considered when designing, implementing, and evaluating the effectiveness of incentives.

Figure 1.2. Considerations Surrounding Tax Incentives



Source: Authors' elaboration.

The following section provides a brief introduction to tax incentives for mining activity. Thereafter, Section 1.3 summarizes the tax structures and incentives in each country, while Sections 1.4 and 1.5 describe the analysis of these tax incentives—that is, a comparative evaluation based on IGF (2019), IGF and OECD (2018a), and Mintz, Bazel, and Reyes-Tagle (2023). These evaluations are exploratory in nature and seek to encourage the tax authorities to undertake further analyses. Although the present analysis shows that these incentives are associated with a significant risk of lost revenue, they benefit both established and new investments. Section 1.6 summarizes some of the current policy discussions in this field and the final section offers several specific tax policy recommendations.

1.2. Brief Description of Tax Incentives for Mining Activity

Large-scale mining is a capital-intensive activity with substantial upfront investment in fixed assets, exploration, and development, most of which is financed through public or foreign resources. In the context of foreign investment, mining taxation seeks to strike a balance between the incentives granted to companies to invest in a country and share of returns from these activities that a society should receive. This balance is not easy to achieve and can, at times, become a source of controversy due to the significant social and environmental impacts associated with mining activities. If taxation is aggressive (i.e., generating higher social returns for society in the present), mining activity may be discouraged and fail to attract investor interest. If taxation is lax, however (i.e., yielding higher private returns in the short term), societies are deprived of resources that could help to provide broader and more efficient public services or support more inclusive social development (van der Ploeg and Venables, 2018). Therefore, to ensure that the economic rents generated by mineral extraction are distributed appropriately, it is vital to design efficient fiscal regimes that strike an appropriate balance between private interests and public benefits.

In principle, the design of tax policy for the mining sector should not differ from that applied to the rest of the economy (tax equity). However, the sector's characteristics lead to differential treatment. First, subsoil resources belong to the State and generate no economic benefit unless they are extracted, processed, treated, classified, and sold internationally.[5] Second, for these activities to occur, the mineral deposit must be economically viable (i.e., localized deposits relative to market returns). In this sense, mining projects are long-term projects that require substantial upfront investments during exploration and development phases, with returns that are contingent on future price expectations (i.e., the expected value of the deposit). Third, mining activities face significant geological, geographic, and social risks. Given these characteristics, a country's general corporate tax burden—applied uniformly across sectors—may be inappropriate for attracting and promoting mining investment. The global pool of resources for investment encourages countries to adopt measures to enhance the competitiveness of their mining activities, often leading to tax competition (i.e., race to the bottom) that can distort the balance between private and social benefits.

Fiscal regimes for mineral extraction have evolved over time in response to changing policy objectives, particularly the aim of enhancing productivity. Traditionally, minerals were taxed primarily through production-based royalties. From the 1950s onward, however, hybrid fiscal regimes became more widespread, combining royalties with conventional forms of taxation (Baunsgaard, 2001). Starting in the 1980s, countries decided to play a more direct role in production, either through equity participation or production-sharing agreements. Currently,

policy emphasis has shifted toward the sector's international competitiveness and incentives needed to attract foreign direct investment (FDI). In general, these incentives have focused on stabilizing fiscal and institutional conditions and have included tax holidays, tax allowances and credits, timing differences, and tax rate reductions, among other measures (Holland and Vann, 1998).

The first incentive, and possibly the most important one, concerns the stabilization of fiscal terms (i.e., **fiscal stability**). Through contractual clauses or legislation, the host government assumes a legal obligation to commit to mining companies that the fiscal rules or agreements in force at the time the contract is signed will be maintained for a specified period (i.e., contractual guarantees).[6] The most common commitments include: (i) exemptions from any subsequent fiscal change (e.g., reforms to the corporate income tax), and (ii) some form of compensation through adjustments to contractual terms to address tax-induced changes in the expected benefits of one of the parties (Daniel and Sunley, 2010). Such clauses may encompass a broad range of host-country laws, limited to fiscal legislation, or even specific fiscal provisions, such as tax and royalty rates (e.g., focusing on the royalty regime and the corporate income tax). From an investor's perspective, a stabilization clause in legislation or a contract should consider the following:

> *[...] a wider formulation tends to be the preferred option, including the right to monetize (which may include the right to export products, and sell interests in the investment), the right to develop a [...] discovery deemed to be commercial, an exchange regime (to keep payments in hard currency, repatriate funds outside the host state and make payments) and the governance of the project itself (Cameron, 2020, p. 111).*

Stabilization clauses are justified by concerns about the quality and strength of institutions in the host mining country (e.g., the transparency of fiscal and legal processes, levels of corruption, and efficiency of tax administration and judicial institutions), or as a safeguard against potential dynamic inconsistencies in government policies (e.g., frequent tax reforms). Given these institutional risks, such clauses may be regarded as a precondition for investment (Lent, 1967). Prima facie, fiscal stability does not constitute a tax incentive. However, characteristics of such agreements, such as their duration and the guarantees they provide, can be seen as fiscal incentives insofar as they exclude investors from fiscal changes the country may need to implement to adjust its policies and promote economic growth, extending beyond the period required to recover the initial investment.[7] Stability in the rules of the game is, after all, an incentive in its own right.

Tax deductions and credits for investment are forms of tax relief based on the value of investment expenditures that meet specific, predetermined conditions (e.g.,

relating to the acquisition of capital goods during exploration activities). **Deductions** provide tax benefits over and above the allowable depreciation of an asset and can be used to reduce a project's taxable income (e.g., deductions for capital expense (CAPEX). Similarly, **tax credits** are used to directly reduce the total amount of tax payable (not just income tax) and may be carried forward or refunded in tax periods following the acquisition of the asset.

Time-based incentives arise from accelerating deductions or deferring the recognition of specific income. Within this category, the most common type of incentive is **accelerated depreciation**, in which the cost of an asset can be deducted at a faster pace than the legally mandated tax depreciation rate. Alternatively, accelerated depreciation may be implemented through a special first-year deduction while maintaining the statutory depreciation rate in subsequent years. Although the legal depreciation schedule remains unchanged, this front-loading of deductions increases the present value of depreciation allowances, effectively raising the depreciation rate in economic terms. Together with tax deductions and credits for investment, these types of mechanisms are known as **cost-based incentives**.

Cost-based incentives do not entail differential treatment in statutory tax rates. Rather, their aim is to reduce the costs companies face when investing, thereby lowering expected costs considered in investment decisions. In other words, the size of these incentives depends on the scale of the operations that companies intend to carry out.[8] They are different from profit-based incentives, which seek to increase the profitability of projects, although not necessarily the most productive ones. The most common incentives of this kind are tax holidays, tax rate reductions, and tax exemptions or exclusions.

Tax holidays are generally used for new mining projects or expanding the capacity of existing operations and are not therefore available for other operations. Under a tax holiday, projects enjoy a grace period during which they are exempt from income tax liability. Occasionally, this period may be extended by one or more additional periods, during which the initial tax benefits may be extended or gradually reduced until they have been eliminated.

The use of tax holidays has long-term effects. As described by Reyes-Tagle and Ospina (2020), tax holidays increase the moral hazard inherent in taxation, as taxpayers perceive that the cost of tax avoidance declines as more such incentives are granted. This produces a tax credibility problem that increases the cost of tax collection for the authorities.

Incentives based on **tax rate reductions** grant preferential tax treatment through rates that are lower than those generally applicable to economic activities. These incentives may apply to international trade (e.g., import and export duties), the value-added tax (VAT) on capital goods and production inputs, stamp duties, subnational taxes, among others. Reduced tax rates may also be applied to

outbound cross-border transfers, such as payments to finance providers or profit repatriation by multinational companies (Otto, 2017). Such incentives differ from tax holidays in that investors' tax liabilities are not fully eliminated. The benefits also extend beyond new or capacity-expansion projects and are not generally time-bound, although they may be restricted to specific mining activities such as exploration.

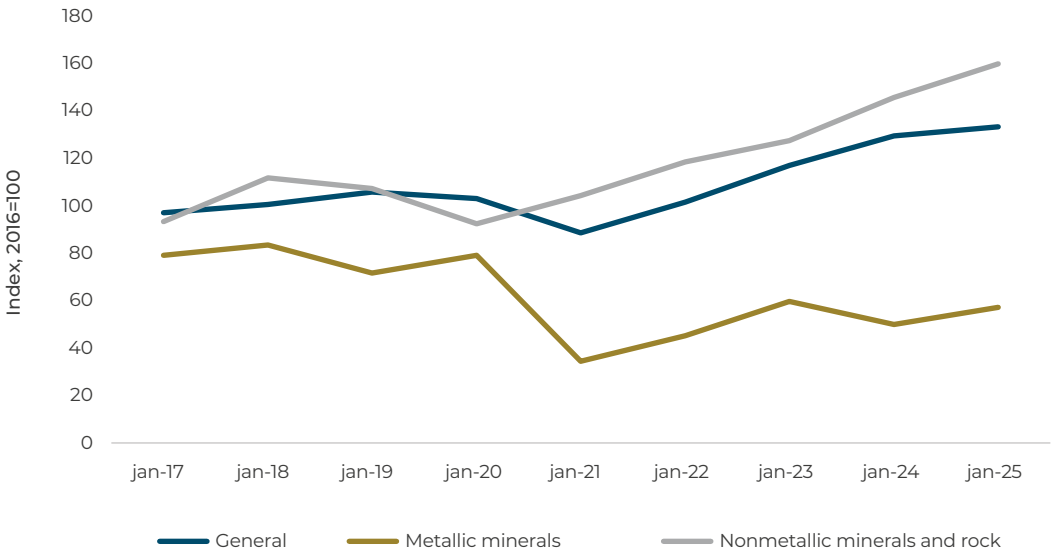
Other available tax incentives include **exemptions** from specific taxes, which may be either national (e.g., tariffs and other import duties, fuel taxes, and VAT on imported inputs) or subnational (e.g., levies or registry taxes, industry and commerce taxes, and development taxes). These incentives can also be implemented in the form of free trade zones, which are geographically limited areas structured around qualified projects that benefit from a variety of tax exemptions (e.g., income and minimum taxes) and/or administrative requirements. These zones are not widely used in LAC, but they belong to the category of tax incentives.[9]

1.3. Tax Incentives for Mining Activities in Selected Latin American and Caribbean Countries

Argentina

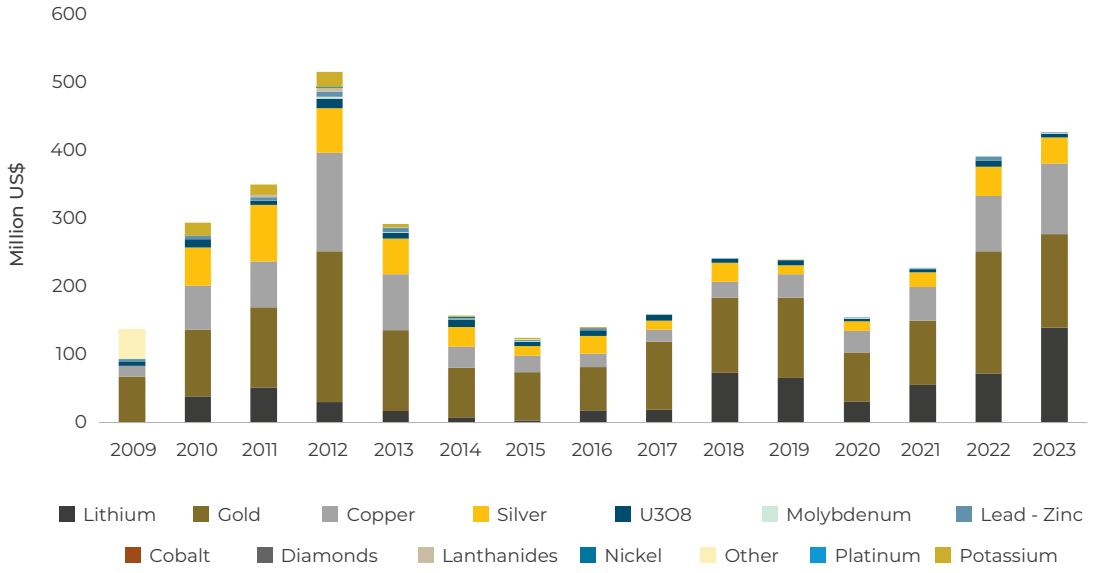
Argentina's mining sector has generally experienced sustained growth in recent years. Mining activity has grown at a rate of 4.5 percent per year since 2017, driven by nonmetallic mineral extraction (7.5 percent). Metallic mineral extraction, meanwhile, expanded at a low positive rate over the same period (Figure 1.3). Exploration budgets have trended upward over the period, mainly relating to gold, silver, and molybdenum extraction, as shown in Figure 1.4.

Figure 1.3. Argentina – Mining Activity Index



Source: National Statistics and Census Institute (INDEC) of the Republic of Argentina.

Figure 1.4. Argentina – Mining Exploration Budget



Source: Authors' elaboration based on S&P Global Market Intelligence data.

Mining companies are subject to a variety of taxes levied by both central and subnational governments (Table 1.1). Exploration rights and mining development concessions are generally granted to local or foreign private companies, which engage in mineral discovery and develop extraction activities until reserves are exhausted (i.e., perpetual concessions). There are protected or reserved areas (defined by the central government) in which state-owned companies may hold mining rights; however, these companies are typically required to grant such rights to private third parties for exploitation (Dentons, 2022). For the purposes of taxation, the value of production (at the mine mouth) is declared by the mining producer and corresponds to the value obtained at the first stage of the commercialization, net of extraction-related costs and expenses.

Table 1.1. Mining Taxation in Argentina

Instrument or tax	Jurisdiction	Description	Affected by tax incentives?
Tax on income	National	35 percent (or 25% under the Large Investment Incentive Regime [Régimen de Incentivos para Grandes Invesiones, or RIGI])	Yes
Withholding tax	National	7 percent of dividends and benefits[a] (3.5 percent after the seventh year under the RIGI)	Yes
VAT or general sales tax (GST)	National	General rate of 21 percent, 27 percent for public services, and 10 percent for specific transactions (e.g., housing construction, health services, passenger transportation, advertising, capital goods)	Yes
Import duties	National	0–35 percent (0 percent for capital goods and inputs)	Yes
Export taxes	National	Gold and platinum (8 percent), copper (0–8 percent progressive rate), other minerals (4.5 percent)	Yes
Financial transactions tax	National	0.006 percent for bank account transactions and 1.2 percent for fund transfers	Yes
Other taxes	National	PAIS tax:[b] 8–30 percent (7.5 percent for import-related transactions)	Yes
Payroll taxes/ social security contributions	National	26.4 percent of monthly employee earnings	No
Wealth tax	National	0.5 percent	Yes
Gross income tax	Subnational	3–5 percent for commerce and services	Yes
Royalties	Subnational	Max. 3 percent of mine-mouth value[c]	No

Source: Authors' elaboration based on PwC (n.d.) and the Law of Bases and Starting Points for the Freedom of Argentines (Law 27,742, enacted in July 2024). Tax regulations as of October 2024.

Notes: [a.] A withholding tax at source (equalization tax) of 35 percent applies to dividend distributions and branch profit remittances made from accumulated earnings generated prior to January 1, 2018, to the extent that such distributions exceed retained earnings as of the end of the fiscal year preceding the relevant distribution. Although this tax was abolished under the 2017 tax reform, it continues to be applied in practice. [b.] The PAIS Tax is a tax levied on certain foreign currency transactions, including, for example, credit operations with foreign banks, digital services, and import-related services. It is a temporary tax introduced in 2019 for a period of five fiscal years. [c.] Mine-mouth value is defined under Argentine law as the difference between revenues and operating costs and expenses, excluding depreciation or other types of expenditures.

The Mining Investment Law (Law 24,196 of 1993) primarily governs tax incentives. Pursuant to this law, mining companies enjoy the following tax benefits:

- 30-year stabilization of fiscal terms, starting from the moment the company submits its technical and economic feasibility study to the authorities responsible for applying the Mining Investment Law. Fiscal stability means that direct taxes, subnational taxes, and import duties and other external trade taxes remain unchanged. It does not cover changes to laws governing indirect taxes and the VAT; royalties; social security contributions; tax refunds, rebates, or reimbursements; or changes in exchange rate regulations.
- 100 percent income tax deduction for costs relating to prospecting/exploration and research and development (e.g., studies, metallurgical testing, and pilot plants).
- Accelerated depreciation on capital investments in new projects or projects to expand capacity (with maximums of 60 percent in the first year and 40 percent over the subsequent two years).
- Reimbursement of VAT paid on goods and services used in exploration activities.
- Customs duty exemption on imports of capital goods and production inputs.
- Special environmental care provision of 5 percent of net extraction revenues (deductible for income tax purposes).

The Mining Code (Law 1,919 of 1886, Article 214) also exempts mining concessions from all taxes or contributions (i.e., a tax holiday) during the first five years, starting from the date the project is registered.

In 2024, the Argentine government approved Law No. 27.742, which established the RIGI,[10] a regime designed to attract large-scale foreign direct investment (FDI). The RIGI provides tax, customs, and foreign-exchange benefits, as well as legal and tax stability and protection, regardless of the economic activity, for long-term investments of US$200 million or more in new projects or in the expansion of capacity of existing projects.[11] In the case of mining activities, the regime applies to the exploration and extraction of gold, silver, platinum, mercury, copper, iron, lead, tin, zinc, nickel, cobalt, bismuth, manganese, antimony, tungsten, aluminum, beryllium, vanadium, cadmium, tantalum, molybdenum, lithium, and potassium. Companies participating in this regime enjoy the same tax benefits as those under the Mining Investment Law, together with the following:

- Reduced income tax rate of 25 percent.
- Reduced withholding tax of 3.5 percent on dividends and profits after seven years of participation in the regime.

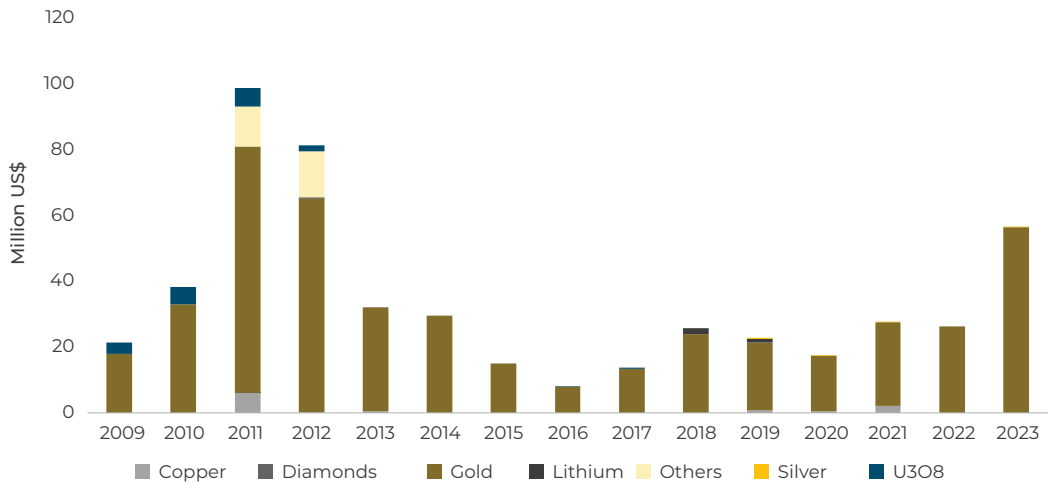
- Tax losses may be deferred to subsequent years with no time limit and are updated using the wholesale price index (IPIM). If, after five years, tax losses have not been absorbed, they may be transferred to third parties.
- For the first five years of participation in the incentives regime, there are no limits on exchange rate losses or deductions of interest payments (thin capitalization) relating to project financing.
- Taxes on bank debits and credits may be credited in full against income tax.
- Exemption from export duties after three years of participation in the regime.
- Exemption from the PAIS tax.
- Tax, customs, foreign exchange, and regulatory stability for the first 30 years of participation in the regime. Mining projects already benefiting from a stabilization period may participate in the RIGI if they qualify for the regime through long-term investments.

Guyana

Guyana is a mining-oriented country, with production concentrated in gold, diamonds, bauxite, stone, and other quarry materials (e.g., sand and marl). According to the Guyana Extractive Industries Transparency Initiative (GYEITI, 2023), in 2020 the mining sector accounted for 12.15 percent of gross domestic product (GDP) and 39.96 percent of the country's total exports. This contribution is overwhelmingly driven by gold, which represents 78 percent of total mining output and concentrates most exploration activity in the sector (Figure 1.5). Data from the Guyana Geology and Mines Commission (GGMC) and the Central Bank of Guyana indicate that gold production declined between 2016 and 2023, falling from 712,707 ounces to 432,113 ounces, a reduction of nearly 40 percent. However, preliminary estimates suggest an 8 percent recovery in 2024 relative to production in the previous year.

Mineral rights are owned by the Guyanese State. Private companies may apply to the GGMC, part of the Ministry of Natural Resources, for prospecting licenses (large-scale mining) or permits (medium-scale mining). Although foreign companies are prohibited from holding mining licenses on their own, they may participate in the development and exploitation of minerals by entering joint-venture agreements with local mining companies (Dentons, 2022). In the case of new large-scale mining projects, investors typically enter into a mining agreement with the Government of Guyana through the GGMC. This establishes their rights regarding the development, exploitation, and marketing of the mineral, as well as their obligations (e.g., environmental and social compliance standards).

Figure 1.5. Guyana – Mining Exploration Budget



Source: Authors' elaboration based on S&P Global Market Intelligence data.

The mining industry is subject to several taxes, as described in Table 1.2.

Table 1.2. Mining Taxation in Guyana

Instrument or tax	Jurisdiction	Description	Affected by tax incentives?[a]
Income tax	National	25 percent of gross income for noncommercial companies and 40 percent for commercial companies	Yes
Withholding tax	National	Dividends: 0–20 percent, interest: 15–20 percent, royalties: 10–20 percent	Yes
VAT or GST	National	14 percent	Yes
Import duties	National	5–150 percent	Yes
Capital gains tax	National	20 percent	Yes
Payroll taxes/ social security contributions	National	10 percent of the remittance or salary (tributor's tax)	Yes
Taxes on mining	National	• Income tax: Gold (2–2.5 percent depending on the price per ounce); diamonds (2 percent of the value determined by the authorities) • Royalties: Gold (5–8 percent depending on the price per ounce); others (1.5 percent)	Yes
Other taxes	National	• Fuel excise tax: 10 percent • Property taxes: 0 percent on net property worth up to GY$40 million, 0.5 percent on every dollar of the next GY$20 million, and 0.75 percent on every dollar of the remainder • Social security contributions: 8.4 percent of monthly worker remuneration	Yes

Source: Authors' elaboration based on PwC (n.d.) and Dentons (2022). Tax regulations as of October 2024.

Note: [a] The granting of tax incentives depends on the mining agreements between companies and the Government of Guyana. The most frequent are included in this table.

Unlike the other countries considered in this analysis, tax incentives are not granted through legislation but instead result from agreements reached in mining contracts with the government. These agreements establish fiscal terms and the scope of fiscal and regulatory stability. In general, such agreements may last 20 years; however, it is possible to renew or extend them for an additional period of no more than seven years. The most common incentives are as follows (Dentons, 2022):

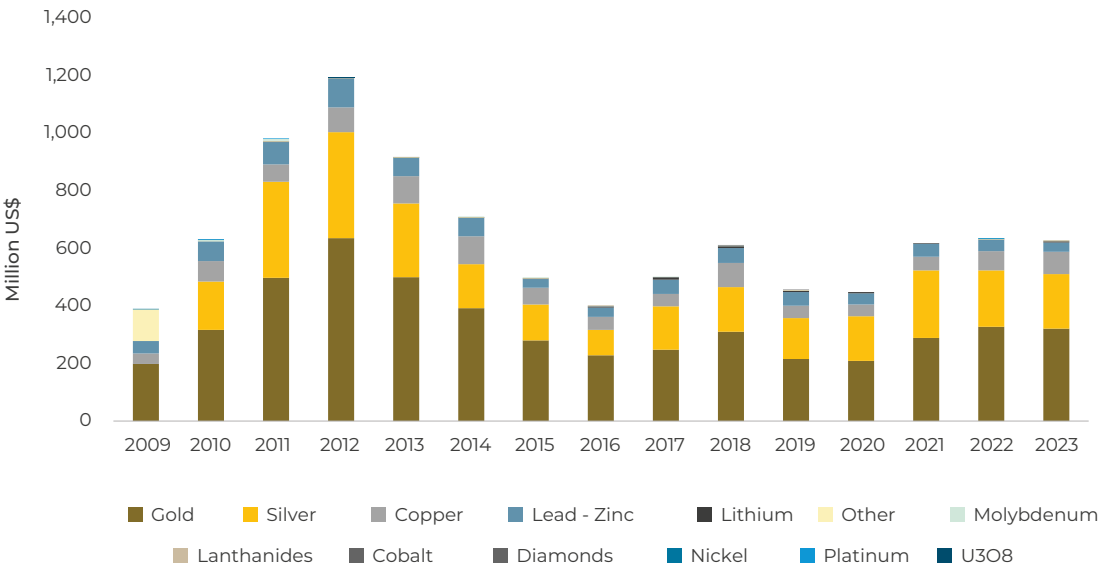
- Exemptions from customs duties on plant machinery and equipment,[12] as well as raw materials and packaging materials used in mining operations.
- VAT exclusion for sales of locally extracted gold and uncut diamonds.
- VAT exemption on raw materials and packaging for projects that export 50 percent or more of their output.
- Unlimited carryover of losses from previous years.
- Accelerated depreciation on plant and machinery for projects that meet the requirements specified in the In-Aid of Industry Act.[13] There is an initial allowance of 40 percent of machinery and plant costs and 10 percent of the cost of industrial buildings and structures. Thereafter, the prescribed rates of depreciation must be applied for capital assets (20 percent using the straight-line method) and 5 percent for buildings and structures.
- Tax exemption on the full and unrestricted repatriation of capital, profits and dividends.
- Benefits from double taxation treaties with Canada, Kuwait, the United Kingdom, and Caribbean Community (CARICOM) countries.[14]
- Exemption from the fuel excise tax.

Mexico

Metal mining activities in Mexico are of considerable scale compared with the rest of the region and the world. The country has a variety of mineral deposits that place it among the 10 largest production locations in the world (EITIMX, 2022). In 2024, it accounted for 20.6 percent of world silver production, 7.6 percent of zinc, 7.1 percent of molybdenum, 6.3 percent of lead, 3.2 percent of copper, and 2.7 percent of gold. This range of exports is reflected in the share of these minerals in the aggregate exploration budget (Figure 1.6). Mining activity has been stagnant over the last 10 years, with a downward trend induced by both policy shifts and changes in labor, environmental, and social costs, as well as the depletion of reserves (Figure 1.7).

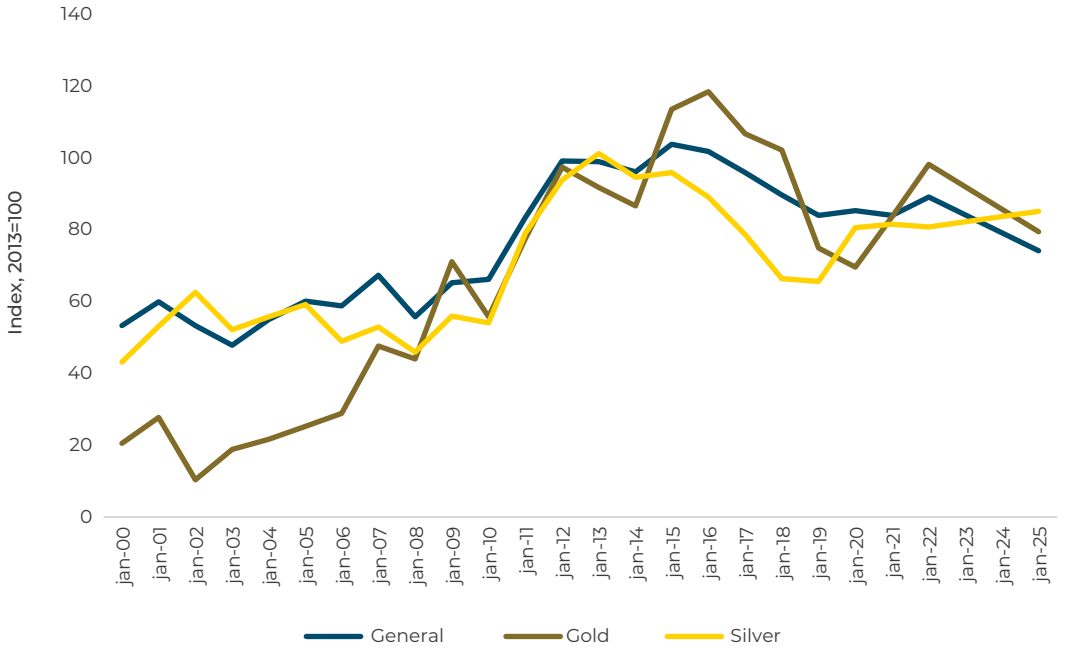
Mineral resources in Mexico belong to the State, which allocates mining rights by means of mining concession titles (exploration and extraction). Table 1.3 summarizes the tax structure for companies in the sector.

Figure 1.6. Mexico – Mining Exploration Budget



Source: Authors' elaboration based on S&P Global Market Intelligence data.

Figure 1.7. Mexico – Metallic Mineral Production



Source: Authors' elaboration based on data from Mexico's National Institute of Statistics and Geography (INEGI).

Table 1.3. Mining Taxation in Mexico

Instrument or tax	Jurisdiction	Description	Affected by tax incentives?
Income tax	National	30 percent[a]	Yes
Withholding tax	National	0–35 percent for fees, wages, salaries, and other forms of remuneration, 10 percent for interest and dividends	No
VAT or GST	National	16 percent	Yes
Import duties	National	0–35 percent	No
Financial transactions tax	National	N/A	No
Payroll taxes/ social security contributions	National	3 percent	No
Taxes on mining	National	• Special mining tax (DESM): 7.5 percent of gross revenues net of income tax deductions, inflation adjustments, interest payments, and investments • Extraordinary mining fee: 0.5 percent of gross revenues where the mineral is gold, silver, or platinum • Tax on mining concessions (surface rental fees) US$0.5–10.94 per hectare (increases each year)	No
Other taxes	Subnational	• Title transfer tax: average of 2 percent • Profit sharing tax: 10 percent of adjusted taxable income • 5 percent of individual income tax payments to the Indigenous and Afro-Mexican communities who own the lands where mining concessions are located	No

Source: Authors' elaboration based on PwC (n.d.). Tax regulations as of October 2024.

Notes: [a] Companies pay the higher of the corporate income tax and a flat-rate business tax known as the single rate business tax (IETU), which has been set at 17.5 percent since 2011.

In general, mining companies are subject to the same fiscal treatment as their peers in other productive activities. The main tax incentives applied in Mexico are as follows:

- Income tax credits for spending and investment on research and development activities.
- VAT credits for expenses and specific investments during the pre-operational period.
- Accelerated depreciation for investments in new fixed assets purchased between October 12, 2023, and December 31, 2024. Accelerated depreciation is allowed as a single-year deduction of a percentage of the cost of an asset (in the same year that it was acquired). The allowable percentages for the deduction are set out in the presidential decree on fiscal incentives for export activities and range from 56 percent to 89 percent depending on the type of asset and the taxpayer's core business activity.

However, mining activity benefits as well from the following incentives:

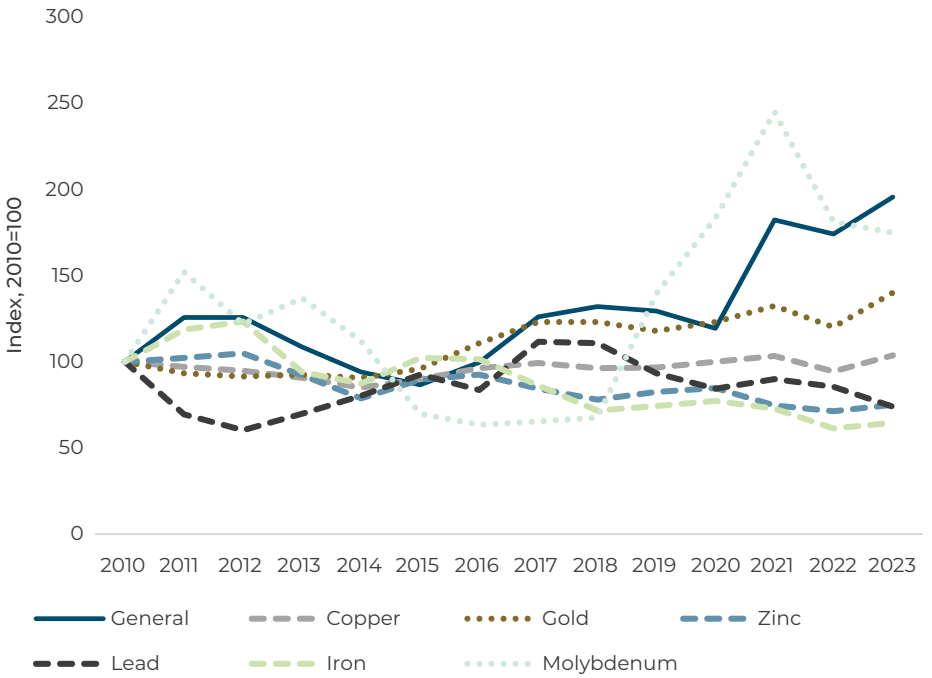
- A 10 percent deduction from corporate income tax for exploration and development expenses.
- A 50 percent reduction in surface rental payments for land with no exploration or development activities for two consecutive years during the first 11 years following the granting of the concession—that is, the Additional Mining Right (AMR). This negative incentive is subject to an additional 100 percent increase in per-hectare fees for concessions that have neither been explored nor exploited for a two-year period starting in the twelfth year of concession tenure.
- An Income tax credit for the special mining tax (DESM).
- VAT exemption for all stages of the gold commercialization.

Under Mexican tax legislation, there is no concept of a fiscal stability agreement. Consequently, changes in tax legislation apply to the activity, without any form of discrimination.

Peru

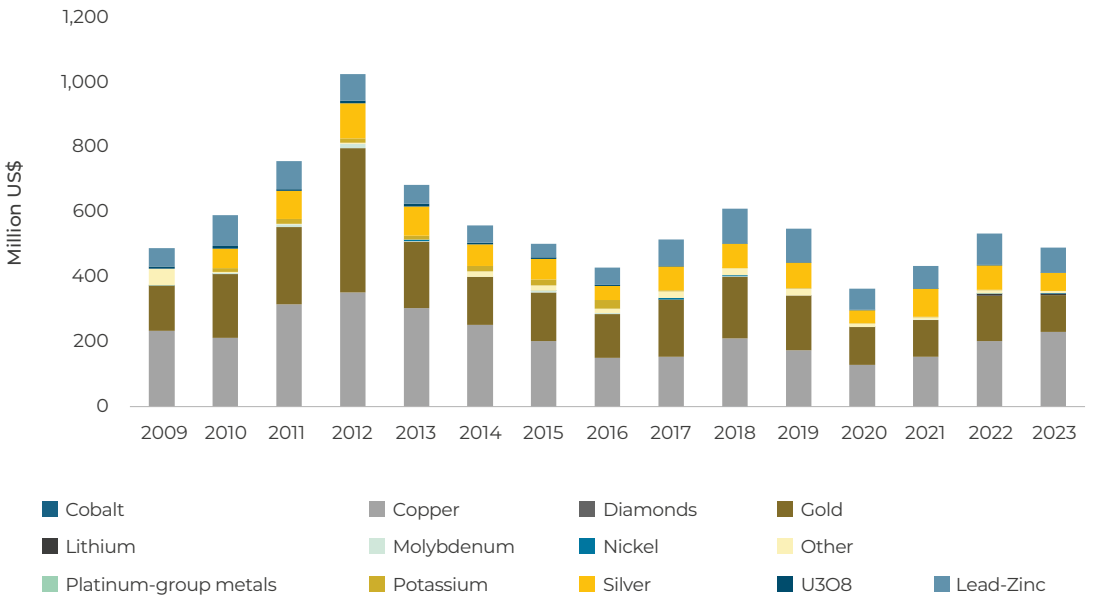
The mining and hydrocarbons sector has contributed 11 percent to annual GDP over the last five years. In terms of mining, mineral exports account for 59 percent of the total (EITIPE, 2024). Mining production is concentrated primarily in copper, iron, gold, and zinc, among others, and this is reflected in the country's exports and exploration activity (Figures 1.8 and 1.9, respectively). The Peruvian government manages mining activity through a system of mining concessions, granting mining rights to private parties such as local or foreign companies. These mining rights constitute an exclusive right to undertake activities such as the exploration, use, and exploitation of mineral resources. Companies engaged in such activities are subject to taxes set by the government, as shown in Table 1.4.

Figure 1.8. Peru – Export Activity



Source: Authors' elaboration based on data from Peru's National Statistics and Information Institute (INEI).

Figure 1.9. Peru – Mining Exploration Budget



Source: Authors' elaboration based on S&P Global Market Intelligence data.

Table 1.4. Mining Taxation in Peru

Instrument or tax	Jurisdiction	Description	Affected by tax incentives?
Income tax	National	29.50 percent	Yes
Withholding tax	National	5 percent on interest and dividends or profit distributions, 30 percent on royalties	No
VAT or GST	National	18 percent[a]	Yes
Import duties	National	0–11 percent	No
Financial transactions tax	National	0.005 percent	No
Payroll taxes/ social security contributions	National	9 percent	No

(*continued on next page*)

Table 1.4. Mining Taxation in Peru (*cont.*)

Instrument or tax	Jurisdiction	Description	Affected by tax incentives?
Taxes on mining	National	• Royalties: 1–12 percent of quarterly operating profits • Special tax on metal mining (IEM): 2–8.4 percent of quarterly operating profits[b] • Special mining tax (GEM): 4–13.2 percent of quarterly operating profits[c] • Mining closure guarantee: 2 percent of annual sales • License fee (mining rights fee): US$3 per hectare (general), US$1 per hectare (small producer), US$0.5 per hectare (artisanal producer)	No
Real estate tax	Subnational	0.2–1 percent of property value	No
Title transfer tax	Subnational	3 percent	No
Other taxes	National	• Employee profit sharing: 8 percent of pre-tax profits • Title transfer tax: 3 percent • Regulatory Agency for Energy and Mining Investment (OSINERGMIN) contribution: 0.12 percent of gross revenue in 2024 • Environmental Assessment and Enforcement Authority (OEFA) contribution: 0.07 percent of gross revenue • Mining pension fund fee: 0.5 percent of pre-tax profits • Temporary tax on net assets: 0.4 percent of net assets over 1 million Peruvian soles (approximately US$400,000) • Municipal contributions and fees charged in exchange for specific public services for taxpayers	No

Source: Authors' elaboration based on PwC (n.d.) and Dentons (2022). Tax regulations as of October 2024.

Notes: [a] The general sales tax rate is 16 percent. The municipal development tax, which is levied alongside the GST, adds a further two percentage points. [b] Applies to mining companies that lack regulatory stability agreements. [c] Applies to mining companies that have regulatory stability agreements.

Tax incentives for the activity are defined in various laws and include the following:

- Refund of the general sales tax (GST) on goods and services acquired for exploration and development activities and for mineral exports. This refund also includes the municipal promotion tax.
- Accelerated straight-line depreciation: up to 20 percent per year for machinery, 5 percent for buildings, and 10 percent for other fixed assets.
- Tax losses may be carried forward for up to four years or indefinitely, up to a limit of 50 percent of taxable net income.
- A tax credit is available for corporate income tax paid on foreign-source income, equal to the lesser of the foreign taxes paid or the Peruvian tax liability on such income. Excess credits cannot be carried forward.
- Regulatory stability agreements (maximum 15 years) for new projects with an initial production of 15,000 metric tons (MT) per day or projects that expand the production capacity of existing projects to 20,000 MT or more per day. Companies engaged in mining-related activities may apply for these contracts if their initial investment is equal to or greater than US$20 million.

1.4. Evaluation I: Comparative Analysis of Tax Incentives in Selected Countries

To assess whether the tax incentives offered by the selected LAC countries strike a balance between promoting mining activities and providing benefits to society, some points of comparison need to be established first. These benchmarks can be informed by experiences from other regions of the world. The report *Insights on Incentives: Tax competition in mining* (IGF, 2019) provides a valuable evidence based on an analysis of fiscal regimes governing 104 projects in 21 developing countries.[15] The findings of that analysis are used here as a reference for the comparative evaluation.

First, tax incentives in selected LAC countries are established in law rather than through contracts (Figure 1.10); this is good practice as it encourages greater transparency in the application of tax rules. The figure below also highlights the following facts. As a result of current policies that favor developing the mining sector and promoting FDI, Argentina offers a larger number of incentives than the regional average and than other comparator countries. Guyana grants more incentives through contractual arrangements than the African countries and fewer through legislation than the LAC region. This reliance on contract-based incentives reflects Guyana's institutional and governance framework. In the case of Mexico and Peru, tax incentives are granted primarily through legislation and are fewer than those

observed on average in the region and in Argentina; within this group, Mexico offers more incentives than Peru. Notably, mining sector incentives in Mexico do not differ from those applied to the rest of the economy, resulting in greater tax equity.

Figure 1.10. Number of Tax Incentives

Source: Authors' elaboration based on Figure 3 of IGF (2019) and current legislation.

Second, the most common incentives relate to corporate income taxes and fiscal stability periods. Table 1.5 presents a list of tax incentives and the number of countries that implement them, including those analyzed in this chapter. As can be seen from the table and from the discussion in the previous section, the purpose of tax incentives is to soften the impact of taxes on investment. Tax holidays, accelerated depreciation, and tax deductions or exemptions help to boost investors' short-term returns. Other tax incentives—such as loss carryovers and tax credits—help mitigate the impact of taxes in the medium and long term. In this sense, the range of incentives available to governments primarily operates by easing the impact of taxation on firms' cash flows.

Third, the most common incentives for investment are accelerated depreciation, VAT or GST reductions and exemptions, and fiscal stability. In the selected countries, accelerated depreciation schemes typically allow a large share of the cost of capital assets—such as plant and machinery—to be deducted in the first year, generally in the range of 40 to 60 percent; Peru constitutes an exception, allowing a first-year deduction of only 20 percent. VAT or GST reductions and exemptions are designed to lower the cost of acquiring capital goods and

production inputs, thereby easing cash-flow constraints during the investment phase. Although fiscal stability agreements are not tax incentives per se, they may effectively operate as such when their duration extends beyond the period required to recover the initial investment. As mentioned in the previous section, Argentina and Peru establish such provisions in law, while Guyana does so through mining or investment agreements. Mexican law does not provide for this type of arrangement.

Table 1.5. Number of Countries with Tax Incentives

Tax incentive	No. of countries[a]	Argentina	Guyana	Mexico	Peru
Accelerated depreciation	10	✓	✓	✓	✓
Tax holidays	11		✓		
Tax deductions for the acquisition of capital assets	7				
Loss carryovers	7	✓	✓		✓
Reductions or exemptions from property taxes or license fees	2				
Reductions or exemptions from royalties	2				
Reductions or exemptions from customs duties and excise taxes	10	✓	✓	✓	
Tax credits	3	✓		✓	
Fiscal stability	15	✓	✓		✓
VAT/GST reductions or exemptions on inputs	15	✓	✓	✓	✓
Reductions or exemptions from withholding tax at source	10	✓	✓		
Other[b]	10	✓	✓	✓	✓

Source: Authors' elaboration based on Figure 5 and Table 3 of IGF (2019) and current country legislation.

Notes: The following countries were included in IGF (2019): Afghanistan, Burkina Faso, Burundi, Cameroon, Colombia, Democratic Republic of the Congo, Ecuador, Guinea, Liberia, Madagascar, Malawi, Mali, Mongolia, Mozambique, Niger, Peru, the Philippines, Senegal, Sierra Leone, Tunisia, and Zambia. [a.] This list excludes Peru as it is analyzed separately in this chapter. [b.] The category of "Other" includes tax incentives not listed above (e.g., subnational tax relief).

Fourth, tax exemptions and deductions are generally used for capital assets and purchases of production inputs without a clearly defined duration (i.e., without termination or sunset clauses). As with tax holidays and accelerated depreciation, it is important to determine a specific time horizon, as these incentives entail a loss of tax revenue that is costly for society, particularly when mining projects have already reached a mature stage of production.

Against this backdrop, the implementation of tax incentives seeks to influence firms' behavior; however, there is a risk that the expected loss of tax revenues will exceed the expected social benefits. In other words, the implementation of incentive schemes should maintain a positive balance between private benefits for investors and benefits to society, with the latter taking precedence. Improvements in social welfare require that granted incentives be both effective (i.e., capable of attracting the most desirable investment) and efficient (i.e., delivered at the lowest possible social cost). The incentives reviewed so far in the four selected countries aim to mitigate the impact of taxation on investment returns and encourage investment decisions. However, granting such incentives entails foregone public revenues, affecting the delivery of public goods and services. Such forgone revenue may also lead to further resource losses when the tax administration is less sophisticated or unprepared to supervise the use of incentives by companies (e.g., tax avoidance schemes). Accordingly, incentives should be assessed ex ante, prior to their granting, and ex post, to evaluate their effectiveness and efficiency. A critical step involves identifying tax incentives and evaluating their effects.

IGF and OECD (2018a) provide a framework for (i) understanding what constitutes a fiscal incentive and how such incentives influence investor behavior, and (ii) categorizing the potential risk of tax revenue losses arising from their implementation. This qualitative evaluation framework complements regulatory impact analyses (RIAs) (OECD, 2008) and provides recommendations to improve incentive design and mitigate their social costs. The IGF–OECD approach to categorizing revenue loss risks is applied below. Table 1.6 uses this framework to describe the tax incentives reviewed here, as well as the behavioral response of investors to each one and their classification in terms of potential risk to the public finances. IGF and OECD (2018a) base risk ranking:

> *[…] on a combination of: (i) the likelihood the incentive will trigger a behavioral response and (ii) the subsequent impact on government revenues. It is grounded in practitioners' experience and judgement rather than statistics (p. 14).*

In Annex 1, this categorization is complemented by a weighting method for risk ratings that allows the aggregate risk to mining tax revenues to be rated for each country reviewed for this study (Table 1.7).

Overall, tax incentives represent a medium to medium-high potential risk. Mexico has the lowest score, due to restrictions on deductions relating to pre-operating expenses (i.e., exploration and development) and the negative incentive tax on inactive land. The following issues are also worth noting. First, as initially discussed, fiscal stability agreements may not induce any specific behavior on the part of investors in the short term.[16] However, the duration of these agreements may exceed the period covered by medium-term fiscal planning frameworks in mining countries (generally between 5 and 10 years). The lack of alignment between these agreements and fiscal policy may give rise to an anticipated loss of revenue (taxes). The associated potential risk is therefore considered to be high. Argentina represents a unique case because this tax incentive is present in two overlapping laws (one specific to the sector and one for production activity in general); this means that the stability period extends beyond 30 years for a new project in expansion.

Second, tax holidays are simply a warning sign for government finances, as they represent a de facto loss of revenue. Accordingly, they pose a high risk to government revenue. This type of incentive is present in two of the four countries examined here: Argentina and Guyana. As previously discussed, Argentina provides for a five-year tax holiday in its mining code. In Guyana, by contrast, tax holidays are established through investment agreements,[17] meaning that the amount of revenue forgone depends on the specific contractual clauses and the duration of the agreements. It should be noted that the timing of tax holidays leads to different assessments of risk. In Argentina, tax holidays are associated with the mine development phase, when costs typically exceed revenues and taxable income is limited; as a result, the associated revenue risk is relatively low. In Guyana, however, such exemptions apply throughout the duration of the agreements and therefore come at a high effective cost in terms of revenue.

Third, both Argentina and grant reductions or exemptions from withholding taxes on outbound payments. In the case of Argentina, reduced tax rates are applied for a defined period of at least 23 years. In Guyana, by contrast, withholding tax exemptions apply for the full duration of the investment agreement. As a result, the incentive may lead to foregone revenue if investors choose to repatriate profits rather than reinvest and expand their activities. Accordingly, these exemptions and their potential behavioral effects, and the associated fiscal risk in the case of Guyana, are assessed as high rather than medium-high, as classified in the IGF and OECD (2018a) framework.

The evaluation points to potential risks to tax revenues from mining. Tax incentives may erode the tax base and, depending on their design, can increase incentives for investors to repatriate profits rather than reinvest them domestically. This type of evaluation is just one aspect of the analysis of tax incentives (i.e., a description of the potential economic costs incurred because of these concessions). To complement this qualitative analysis, tax authorities and relevant policymakers

need to employ financial models to estimate the cost of incentives (net of benefits) and their impact on investment decisions and the fiscal accounts. Partial equilibrium models such as those proposed by Luca and Puyo (2016) and IGF and OECD (2018b) provide a quantitative overview can help inform these assessments and support evidence-based policy decisions.

Table 1.6. Types of Tax Incentives and Associated Behavioral Response

Fiscal incentive	Potential behavioral response	Risk
Tax holidays or income tax rate reductions	Investors may increase their income during the tax-free period by accelerating production and shifting profits offshore.	High
Fiscal stabilization agreements	Fiscal stabilization does not trigger a specific behavioral response. However, combining incentives with excessive use of broad and long-term fiscal stability provisions will magnify the adverse impact of tax incentives, including the unintended consequences, by potentially cutting off government's ability to correct mistakes and unexpectedly large revenue losses.	High
Reductions or exemptions from withholding tax at source	Investors may increase the amount of resources transferred abroad (e.g., where exceptions are granted for interest expenses or charges for administrative services paid to foreign affiliates), usually to low-tax jurisdictions.	Medium-high
Cost-based incentives	Investors may inflate their capital expenses (i.e., money spent on assets, buildings, and equipment) above what is needed to maximize the tax benefit. This is more likely to occur where transactions are repeated or involve counterparts with which there is some form of vertical or horizontal relationship.	Medium
Exemptions or reductions in import duties	To increase their deductible expenses, investors may increase the cost of fixed assets and production inputs where these are purchased from related parties (or if customs requirements are not enforced).	Medium
VAT reductions or exemptions	To increase their deductible expenses, investors may increase the cost of capital assets and other production-related goods and services purchased from related parties.	Medium

Source: Authors' elaboration based on Table 3 of IGF and OECD (2018a).

Table 1.7. Qualitative Risk Rating

Type of tax incentive	Argentina	Guyana	Mexico	Peru
Accelerated depreciation	Medium	Medium	Medium	Medium
Income tax rate reduction	High	High		
Loss carryovers	Medium	Medium		Medium
Reductions or exemptions from customs duties and excise taxes	Medium	Medium	Medium	
Tax credits	Medium		Low	
Fiscal stability agreements	High	High		High
Tax holidays	Low	High		
VAT reductions or exemptions	Medium	Medium	High	Medium
Withholding tax reductions or exemptions	High	High		
Other	Medium	Medium	Low	
General risk to revenue	**Medium-high**	**Medium-high**	**Medium**	**Medium-high**

Source: Authors' elaboration based on Table 3 of IGF and OECD (2018a) and Annex 1.

1.5. Evaluation II: Effective Tax Rates

Assessing the risk of revenue losses is a necessary part of gauging the effectiveness and efficiency of tax incentives. It establishes a line of argument regarding the desirability of such incentives and provides a characterization that compares their effectiveness with potential economic costs. Complementing the qualitative analysis presented here, Mintz, Bazel, and Reyes-Tagle (2023) offer a quantitative assessment using three measurements of taxation: effective statutory rates, average effective rates, and marginal effective tax and royalty rates.[18]

The effective statutory tax rate (STR) is the sum of national and subnational tax burdens—particularly corporate income taxes, taxes on mining income (where appropriate), and royalty rates—expressed as a percentage of price-cost margins. STRs are relevant to investor decisions such as transfer prices, profit distribution, and financing structures (debt versus equity). They provide a measure of the level of profit taxation before capital costs are factored in.

In contrast, the marginal effective tax and royalty rate (METRR) explicitly accounts for capital costs in the assessment of profitability. It measures the degree to which taxes increase the pre-tax rate of return that investors require to break even. In other words, it measures the size of the intertemporal distortion created by the tax regime in the case of (marginal) investment projects with returns that are

just sufficient to cover costs. Where companies can deduct capital costs more than the economic costs incurred for an investment, the METRR will generally be lower than the STR. In the absence of capital incentives, however, the STR and METRR will be equal.

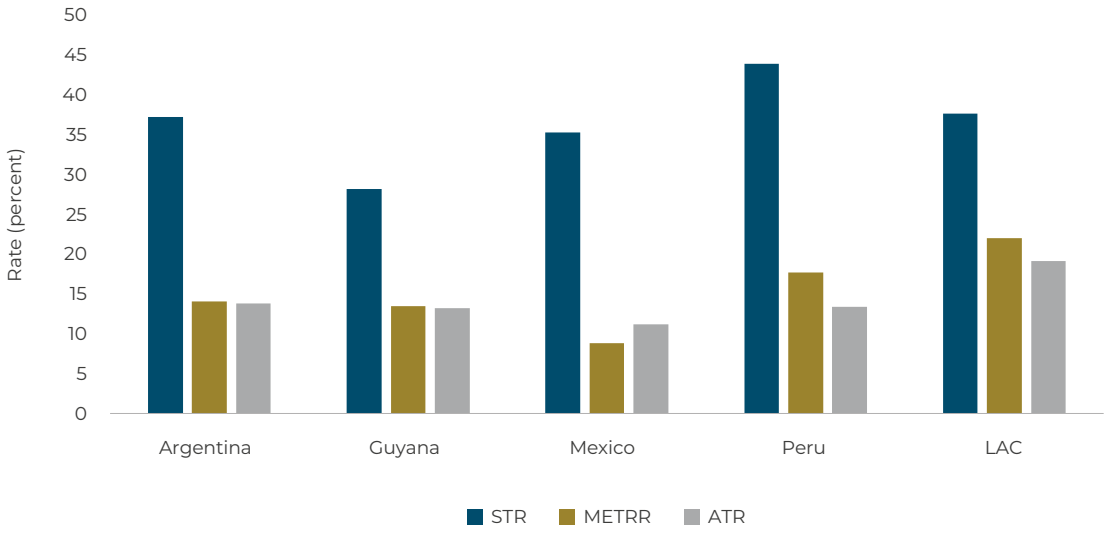
The average tax rate (ATR) is the share of profits used to pay taxes and royalties on the earnings from marginal and inframarginal investments. In other words, it compares the net present value of cash flows before and after tax. The ATR differs from the METRR in that taxes are calculated as a proportion of all profits, not only profits from the last unit of investment. This indicator is used to analyze investment decisions at the extensive margin—in other words, decisions regarding location (e.g., when an investor decides to locate a project in one jurisdiction out of many, or implement one of a variety of possible technologies).

Figure 1.11 shows these rates based on estimates by Mintz, Bazel, and Reyes-Tagle (2023). It should be noted that these authors did not consider tax incentives under Argentina's RIGI as their study was completed one year before the measures were introduced in the country.

As stated above, effective statutory rates indicate how gross revenues are taxed by a government (before deducting capital costs). Among the countries analyzed, Guyana exhibits the lowest STR (28.1 percent), reflecting the structure of its mining tax regime and the relatively moderate statutory burden applied to the sector. The highest STR is in Peru (43.9 percent), reflecting a combination of progressive corporate income taxes, royalties, and the excise tax.

The presence of cost-based tax incentives leads to significantly lower effective marginal tax and royalty rates than statutory rates, which are themselves below regional averages. Mexico exhibits the lowest marginal effective tax and royalty rate (METRR) at 8.8 percent, while Peru shows the highest at 17.6 percent. A similar pattern is observed for effective statutory rates. Argentina and Guyana record METRRs of 14.1 percent and 13.5 percent, respectively.

Figure 1.11. Effective Tax Rates



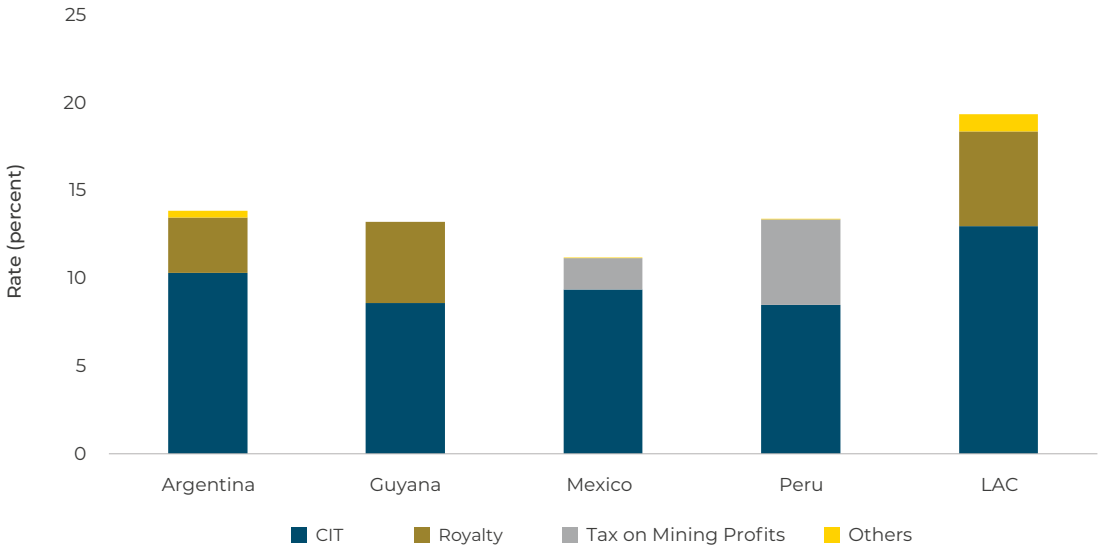
Source: Authors' elaboration based on Figure 14 of Mintz, Bazel, and Reyes-Tagle (2023).

Note: The LAC figure is calculated as the average of the country-specific rates provided in the study.

Regarding ATRs, the value of tax revenue as a proportion of profits is very similar in the selected countries, albeit lower than the average for the region. Argentina has the highest ATR (13.8 percent), while Mexico has the lowest (11.1 percent). These percentages suggest that none of the selected countries receives more than a tenth of the profits generated. These rates are attractive both to new investors in the country and those already present, as they are lower than in other parts of the region (Figure 1.11).

ATRs may be higher or lower than METRRs depending on fiscal provisions in place. When returns on inframarginal projects exceed those on marginal projects, the ATR at a given statutory rate is likely to exceed the METRR. This is the case in Mexico. However, the METRR could exceed the ATR if the tax rate on marginal profits is higher due to the limited availability of tax incentives (e.g., in Argentina, Guyana, and Peru). This contrast arises because, except for Mexico, corporate income tax incentives in the selected countries reduce the relative weight of income taxation compared with royalties (Figure 1.12). The relatively low level of tax revenue in Mexico is partly a reflection of the low rate of its profit-based royalty, which at 7.5 percent is closer to the percentages typical of revenue-based royalty schemes (Appendix A of Otto et al., 2006). These results show that in the countries analyzed here, as well as others in the region, incentives are more prevalent in existing projects than in new or capacity expansion projects.

Figure 1.12. Breakdown of ATRs



Source: Authors' elaboration based on Figure 15 of Mintz, Bazel, and Reyes-Tagle (2023).

Note: The LAC figure is calculated as the average of the country-specific rates provided in the study.

The analysis so far has focused on country-level issues. However, mining activities are as diverse as the minerals that are economically viable for extraction in a particular country. Mintz, Bazel, and Reyes-Tagle (2023) show that tax incentives can have different effects depending on the mineral in question (Table 1.8).[19] These heterogeneous responses—stemming from technology, investor behavior, or both—underline the delicate balance associated with incentive policies. As a result, and given that the treatment of mining activity (and even different mineral products) can be differentiated from that of the rest of the economy, it is important that policymakers carry out technical analyses that consider the sector's microeconomic characteristics (e.g., cost separability and joint production structures) when quantifying the potential effects of tax incentive design.

Table 1.8. METRR by Country and Mineral (in percent)

Mineral	Argentina	Guyana	Mexico	Peru	LAC
Bauxite	13.7	10.9			19.5
Copper				17.6	17.4
Gold		16.1		16.1	21.9
Iron					31.3
Lead			8.8	16.1	12.5
Lithium	12.8				18.2
Manganese					32.8
Molybdenum				16.1	17.0
Nickel					28.0
Silver	15.6		8.8	16.1	21.7
Tin				16.1	24.0
Zinc			8.8	16.1	21.0

Source: Authors' elaboration based on Table 7 of Mintz, Bazel, and Reyes-Tagle (2023).

1.6. Current Policy Orientation

Tax incentives are the result of governments' interest in promoting economic development. They are intended to promote activity, enhance competitiveness, and—in the long term, through greater economic activity or positive externalities—expand the number of resources available for public policies to support higher levels of sustainable growth. However, the direct cost of this type of support (i.e., the trade-off) is potential revenue foregone in the short and medium-term, even though this revenue is necessary to deliver public goods and services while the incentives are in place. The results presented here show that the incentives implemented in the region are significant and erode the tax base.

Where tax incentives affect profit taxes and withholding at source for transfers or remittances, they can potentially create negative tax competition among countries. For this reason, these types of tax provisions are not recommended. Needs are also abundant, particularly in the wake of the COVID-19 pandemic. To streamline the use of incentives, actions must be undertaken to restore balance between investor returns and benefits to society, even under circumstances such as the presence of fiscal stability arrangements.

Current policies in the countries covered in this chapter focus on strengthening the competitiveness of mining activity and improving its inclusivity. In 2022, for example, Peru extended legislation providing tax incentives for exploration until

2027. In Argentina, new mining projects and capacity-improving projects may request incentives under the RIGI if they meet its conditions (see the subsection on Argentina in Section 1.3). In Guyana, the Fiscal Enactment Amendment Bill No. 2 of 2022 eliminated the personal income tax on mining workers, exempted the sector from VAT on lubricating oils, and reduced the income tax for gold from 3.5 percent to 2.5 percent.[20] In contrast, Mexico's 2022 fiscal reform limited the deferral of income tax deductions for the depreciation of intangible assets and buildings and added new obligations concerning Indigenous communities.

Considering these developments, governments are increasingly aware of the need to improve the quality of their tax administration and incentive regimes. Argentina, Mexico, and Peru have undertaken measures aimed at addressing harmful competitive practices and enhancing the exchange of information, as well as other actions aligned with global initiatives to prevent base erosion and profit shifting (BEPS). These initiatives encourage governments to review their preferential tax regimes to avoid practices that might exacerbate tax competition, resulting in an uneven playing field between countries. The OECD (1998) sets out the relevant criteria for identifying preferential tax regimes—i.e., regimes that provide favorable differential treatment to investors, such as tax incentives (Box 1.1). These criteria, which are part of Action 5 of the OECD/G20 Inclusive Framework on BEPS, are relevant to the cases analyzed here and can help to identify actions that would mitigate undesirable effects for the mining country or the investor's home country (or both), as well as third countries.

Box 1.1. Criteria for Assessing Preferential Tax Regimes

Key factors

- The regime imposes no or low effective tax rates on income from geographically mobile financial and other service activities.
- The regime is ring-fenced from the domestic economy.
- The regime lacks transparency.
- There is no effective exchange of information with respect to the regime.
- The regime fails to require substantial activities.

Other factors

- An artificial definition of the tax base.
- Failure to adhere to international transfer pricing principles.
- Foreign source income exempt from residence country taxation.
- Negotiable tax rate or tax base.
- Existence of secrecy provisions.

Source: Authors' elaboration based on Table 1.1 of OECD (2019).

Among these actions are measures to address practices related to mineral pricing. It is known that income tax revenue and the tax incentives that affect it depend on mineral prices, which are usually established through supply contracts. The owners of a project and the buyer of the mineral (i.e., the parties to the contract) are often part of the same business group. In this type of transactional situation, prices are not necessarily driven by cost but rather by organizational relationships (e.g., vertical or horizontal). These are transfer prices, and they represent a potential risk to tax revenue that is difficult to manage in the absence of rules for controlled foreign corporations. Where mineral demand is strong and no such rules exist, transfer prices can erode the income tax base (by undervaluing the transaction), allowing profits to be shifted out of the mining country. The impact of transfer prices is intensified where tax incentives are present, as these increase the scale of transactions and further limit potential tax revenue. In this respect, the four countries analyzed here have regimes that are sufficiently developed that they require transactions to be carried out in accordance with the arm's length principle.[21] Readhead (2018) and Viola, Lassourd, and Readhead (2023) provide a framework for assessing and delineating transfer price rules for the sale of mineral products under fully competitive conditions.

Considering these initiatives to strengthen their revenues, countries have agreed on actions to combat base erosion practices as part of agreements or treaties. Examples include agreements for the exchange of tax information, which will help to establish arm's length relationships between companies belonging to a single business group. These treaties can also help to prevent harmful double taxation and eliminate barriers to cross-border trade and investment (BEPS Action 6). Argentina has double taxation treaties (DTTs) with 25 countries (4 pending ratification) and 11 totalization agreements. Guyana joined the Global Forum in 2016 and has signed DTTs with Canada and the United Kingdom. It also participates in information exchange arrangements under the CARICOM framework. Mexico has 60 DTTs and Peru 8 (in addition to the Andean Community's double taxation standard). Argentina, Mexico, and Peru are also taking steps to prevent the tax base erosion and profit shifting associated with special regimes (OECD model).

1.7. Tax Policy Recommendations

The purpose of tax incentives is to attract and sustain investment, add value to mineral resources, and enable public policies that promote sustainable economic growth over time. To achieve these objectives effectively and efficiently, however, governments must first conduct a cost-benefit evaluation to manage the potential risks posed by these policy instruments. The following actions are recommended to assist governments in assessing these incentives as part of developing robust sector policies.

A critical first step toward conducting rigorous and effective assessments involves strengthening institutional capacity and governance in the sector. Given the complexity of mining activity—including its price cycles and its direct and indirect effects on the economy and the environment—institutional arrangements are required that foster effective sector development policies and sound regulation, supervision, and control. This institutional framework, in turn, requires coordination across different levels of national and subnational government to identify opportunities and potential problems, as well as roles and responsibilities for managing, promoting, and supervising the sector and the policies that govern it. There is also a need to strengthen and maintain a cadre of qualified and independent human talent.

Second, with strong governance arrangements in place, robust assessments of the mining sector and its taxation should be carried out regularly to support informed and transparent decision-making. Tax incentives should be evaluated based on their efficiency and efficacy in promoting the sector and its economic development. Such assessments are good practice in regulatory processes when carried out both ex ante and ex post. To be effective, ex ante assessments require the analysis of various policy alternatives. Ex post evaluation requires well-designed

indicators that are collected, disseminated, and evaluated on a regular basis so that the policies being implemented can be calibrated or modified. In addition, when the results of such evaluations are published and discussed, they support transparency in decision-making and ensure that the tax incentives granted are based on evidence. These evaluations can be carried out within the framework of the exercises proposed here, in tandem with the implementation of the models developed by Luca and Puyo (2016) and IGF and OECD (2018b).

Third, given that tax revenues are determined based on contract prices, they are affected by the vertical and horizontal relationships that may exist among the parties involved. Accordingly, transfer prices play an important role in determining the effectiveness and efficiency of tax incentives. To minimize unintended consequences, tax regulations in mining countries should be accompanied by vertical and horizontal control rules that strengthen the capacity to verify cost and expense structures, and, by extension, prices set across the entire value chain. The OECD (2022) has published guidelines concerning this topic. Another recommended action is to implement reference prices obtained from reputable, publicly available sources.

Fourth, consistent with the above, governments can take steps to implement agreements that seek to prevent base erosion and profit shifting (i.e., regional cooperation for tax compliance). Mining countries have participated in various tax treaties (both bilateral and multilateral) aimed at preventing negative outcomes and harmful tax competition practices. To avoid this type of situation, the OECD/G20 BEPS initiative has established a minimum standard (Action 6).[22] Given that tax incentives promote tax competition, the adoption of these types of actions and measures will be important for avoiding potentially adverse consequences.

These policy recommendations can be summarized as follows: tax incentives for mining investment are part of a broader policy design that, to be effective and efficient, requires institutional capacity for planning, implementation, and verification, as well as clear objectives for long-term sustainable economic development. In this regard, tax incentives seek to directly stimulate activity and development in the mining sector, while also generating growth in the rest of the economy through production linkages. However, the provision of incentives is accompanied by a risk of revenue losses and threats to the sustainability of economic growth in the long term. It also involves higher costs of the part of the tax administration, which must supervise and control the implementation of incentives across a complex and integrated activity. Therefore, the economic justification for tax incentives should be assessed based on their effectiveness and efficiency in achieving clearly defined objectives, relative to alternative policies that could pursue the same goals, while also considering their contribution to economic growth and the feasibility of effective administration.

CHAPTER 2.
CAN COMPETITIVE BIDDING INCREASE MINING? THE CASES OF BRAZIL, COLOMBIA, AND SURINAME

2.1. Introduction

Competitive bidding (also known as the auction system) is a method of allocating mining licenses that may either replace or exist alongside the traditional first-come, first-served process.[1] The process begins when the government issues bidding documents and geological data for the mineral deposit to be licensed. An intergovernmental organization provides this information and is empowered to lead the process and assign licenses to potential investors, who compete for the right to develop the resource. The investor whose bid is considered most suitable from an economic, financial, and technical perspective will be awarded the license.

The most frequently used method in the mining sector is known as "first-come, first-served," in which the license is awarded to the first qualified investor who demonstrates interest in developing the resource. Competitive bidding systems are used by the State for areas in which the composition and scale of the deposit are known. Investor participation in these projects is greater, which allows the State to select the best technical and financial proposals for extraction. The bidding system is only considered superior to the first-come, first-served system under these circumstances.[2]

From this standpoint, it is argued that competitive bidding can increase government mining revenue in three ways: (i) monies paid by all bidders (the cost of bidding), such as bidding fees; (ii) the financial components of a bid, such as the signature bonus; and (iii) the increased profitability of a mine due to the selection of an investor who has the financial and technical capacity and experience needed to optimize the deposit. This can also increase project revenues by reducing community management costs and ensuring that mine byproducts are utilized.

Competitive bidding can increase revenue if governments effectively stipulate requirements relating to one or more of these categories in the bidding documents. This mechanism allows the authorities to set terms that maximize revenue, such as or additional tax payments by the successful bidder. In practice, competitive bidding does not generally

seem to have been used for this purpose in Latin America and the Caribbean (LAC); instead, it is used for a variety of purposes (see Section 2.4).

The present research has led to the identification of three examples of the use of competitive bidding to increase fiscal revenue. In two of these, the bidding process directly requires participants to offer improved financial terms—in one case, through the introduction of a signature bonus, and in the other, by establishing an additional contribution that will generate revenue once the project enters production. In the third case, however, the benefits are not entirely monetary, as the has increased only moderately compared with other objectives pursued through the competitive bidding system.

Second, competitive bidding allows the government to actively manage mining policy across all stages of the production chain, from the analysis of bidders to allocation of the license and signing of the contract. As the authorities are responsible for selecting which investors may develop the country's mining resources, it is important to strengthen their capacity to supervise mining operations. Thus, when implementing an auction process, measures must be taken to optimize information on available resources and map participants in the production chain (as well as their supporting entities).

Third, competitive bidding can encourage changes in mining legislation at the State and/or regional levels insofar as it responds to public policy objectives for the development of both the mining sector and the country. These objectives include increasing government revenue, strengthening the supervision and control of investor actions, and reducing information gaps and improving the quality of data on mining activities on public land. This chapter analyzes the use of competitive bidding in LAC, evaluating its effectiveness by reviewing case studies from the region and examining its coexistence with other methods of allocating licenses, as well as the challenges faced in implementing such processes for the allocation of mining areas.

In summary, under the right conditions, competitive bidding can be an effective form of allocating mineral extraction licenses to companies. This publication explores how countries with abundant natural resources can use competitive bidding to increase government revenue and modernize the oversight of mining operations, thus bypassing processes established under mining codes dating back one or two decades. Competitive bidding leverages competition and transparency to select the most efficient investors—technically and financially—to develop a particular mineral resource (or to at least exclude those who do not meet proposed expectations).

This chapter is based on Chapter 13 (Competitive Bidding) of the book *The Future of Resource Taxation: 10 policy ideas to mobilize mining revenues* (Readhead, et al., 2023), which was published by the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF) and the African Tax Administration Forum (ATAF). Although the use of competitive bidding processes is still at an early stage, it has generated discussion surrounding their potential benefits and risks. The

objective of this chapter, therefore, is to provide insight into the implementation of these processes in the mining sector in three LAC countries: Brazil, Colombia, and Suriname.

The choice of these countries reflects the availability of regulatory information and the ability to interview individuals involved in designing or implementing the bidding policies. This allowed the IGF to compare its hypotheses with observed practices. This chapter examines other examples of competitive bidding (Box 2.1) and describes how the region has initiated efforts to develop the methods over the past decade.

The energy transition has intensified world demand for minerals, encouraging countries with abundant natural resources to use competitive bidding processes to maximize fiscal revenue. Transparency and oversight in these processes are key for preventing corruption and ensuring that real economic benefits materialize (NRGI, 2021). This chapter describes the conditions required to successfully implement competitive bidding for the allocation of mining licenses while also increasing fiscal revenue from the sector. It also contrasts the success factors identified in Readhead et al. (2023), described in Section 2.3, with the information obtained on Brazil, Colombia, and Suriname (Section 2.4). Lastly, it provides conclusions that address the question posed in the title of this chapter (Section 2.5).

2.2. Key Features of Competitive Bidding Processes for Allocating Mining Licenses

The use of auction systems in the mining sector requires that several prior conditions be met. Government processes must include the use of geological studies to value mineral deposits, while policies should target returns that go beyond royalties, incorporating local content elements so that the benefits from mining activity also drive community development, domestic industry, and sustainable production linkages.[3]

Although bidding processes for the mining sector share common principles with other public processes—for example, transparency, the equal treatment of bidders, and competition—their legal and economic rationale should not be seen as equivalent.[4] Competitive bidding for the allocation of mining licenses has features specific to the sector, such as the inclusion of exploration and exploitation stages and considerations of a social, fiscal, and production nature. This section describes its basic components, the different types of bidding, and the stages of the process.

What is competitive bidding?

Competitive bidding uses market competition to determine the price of a transaction. A process that lacks a competition stage between several bidders cannot be characterized as competitive bidding, even where it achieves objectives of increasing the return obtained by the State from a given investment. An example of this is where a is levied in advance on investors interested in obtaining information on the areas available for allocation.

All auction processes for mining licenses follow a structured sequence. The government makes an area available for development and shares the same geological and technical data with all interested parties. Based on this data, investors estimate the value of the resource and prepare their bids. Lastly, the proposal that best fulfills the government's objectives and the criteria included in the bid package is selected.[5] Finally, the investor who best meets the minimum criteria established in the government's terms for the process obtains an exclusive right to exploit the resource. The criteria for participating in the tender include the following:

- Investment commitments (capital expenditure)
- Work program (production timelines and volumes)
- Local content
- Fiscal terms (e.g., royalty rate or share of profits)
- Signature bonus
- A mixture of the above

An auction process can be viewed through the lens of game theory,[6] as it involves multiple bidders who compete for the same resource and take strategic decisions to maximize their profits while anticipating the actions of their competitors. Bids reveal how much value investors attach to the mineral deposit based on available geological information, their own technical experience, and their assumptions about the proposals of other stakeholders. Each participant seeks to submit an offer that is sufficiently competitive to win, but at the same time provide an adequate return on investment. Balance is key: if an investor's bid is too conservative, they risk losing the mining rights to another bidder. If they bid too high, they may not be able to deliver on their commitments and risk losing the license or incurring financial losses.

What are the different types of competitive bidding?

There are many ways to design an auction. Game theory (Bratvold and Koch, 2015) predicts different outcomes depending on the specific design of an auction. Governments can choose from them depending on the type of license they are offering, the level of interest from prospective buyers, and their own capacity to manage a complex licensing round. The most common designs include the two modalities described in Table 2.1.

Table 2.1. Types of Design Commonly Used in Competitive Bidding

Sealed bids	Ascending bids
In this method, bidders submit closed bids just once in a licensing round, giving them only one opportunity to compete. The winner may be the bidder who bids the highest or, alternatively, the second highest (which helps to avoid overestimates). This format reduces the risk of investor collusion, as the bids remain secret. Such protection is strengthened where controls are implemented to identify business links and conflicts of interest.[a]	In this type of auction, bidders openly submit multiple bids one after the other, trying to outbid each other until one bidder remains who bids the highest based on the stipulated terms. Bidders adjust their bid offers subject to the bids quoted by other bidders. This design is prone to collusion, however, as bidders can coordinate beforehand to determine who wins.

Note: [a.] See de Michele and Vieyra (2022) for additional information on this issue.

How is competitive bidding different from the first-come, first-served method for allocating mining licenses?

Competitive bidding differs from the traditional first-come, first-served method in several respects. The first is the fact that in competitive bidding, the State takes the initiative to offer investors the mineral deposits located in its territory. Under the traditional method, investors are the initial offerers and may submit an offer at any point in time.

The second difference lies in the level of control that the State gains when it is the party to make the initial approach to investors. This contrasts with a situation in which the investor is the only one with the studies and experience regarding the mineral resources concerned, with the State assuming a passive stance. Under competitive bidding, and if sound geological and market studies are available, the State can fulfill its planning and regulatory role based on prior information about the type and quality of the mineral, its valuation, possible uses, and its integration into the domestic production chain. It can also anticipate whether the investment will be export-oriented, based on the development of the territory concerned, the type of investment required, and other contextual factors. With this data in hand, the State is in a better position to identify which investor bids are realistic and which are overly optimistic, thus strengthening its role as an informed and strategic grantor.

In contrast, in the first-come, first-served model, the authorities depend on information provided by the investor and lack independent data that they can use to verify the information's veracity or the offer's compatibility with the public interest. This hinders the State's control over costs, taxes, and strategic decisions, though it does provide it with access to important geological information. Returns are calculated passively, as the State accepts offers at any time, with little ability to influence the market for the mineral or anticipate economic or environmental impacts in phases such as extraction, byproduct management, or mine closure.

The third difference is that the first-come, first-served model does not allow the authorities to compare bidder proposals, as there is rarely more than one interested party per area. Accordingly, the government usually evaluates just one offer, opening the door to potential collusion in which investors coordinate to offer terms favorable to their interests while simulating competition through the submission of unviable bids. This reduces the incentive to submit competitive proposals and curtails the government's ability to regulate the market. In contrast, competitive bidding allows the state to properly value the minerals offered and establish its expectations through the tender documents. This helps to reduce manipulation in the allocation of licenses and strengthens government control over a resource that, by nature, is a monopoly. It thus encourages more robust bids and protects the country's economic interests.

The bidding documents allow the State to anticipate investor behavior based on a realistic understanding of the efforts and investment required to ensure that a mining project is successful. When the entire value chain is considered, this not only allows the authorities to design a more attractive bid package but also strengthens their negotiating position once the license has been granted. This approach helps them to defend their interests over a monopoly resource and determine whether the existing legal framework is sufficiently protective of community rights and the environment (or at least determine the standards that should be required of the investor).

By identifying such factors, the State can anticipate risks in sensitive areas and act as the guarantor of the public interest, thus encouraging investments that generate fiscal revenue without jeopardizing social rights. In contrast, the first-come, first-served model leaves such assessments in the hands of the investor. In practice, this has led to social conflict and violence in areas that have been allocated without any competitive process.

What are the different stages of competitive bidding?

The bidding process for allocating mining licenses comprises five general stages that contribute to the effective functioning of the process (Table 2.2). Three of these stages—shown in blue in Table 2.2—are adjacent to the bidding process, and their content falls within the powers of the State, which must lead each phase of the process to ensure that economic and social objectives for the mining sector are achieved. The other two phases—shown in orange —are essential for designing a competitive bidding process.

Table 2.2. Key Phases in Competitive Bidding Processes

Phase	Characteristics
Prequalification	With prequalification: · Create a pool of bidders by inviting potential bidders to submit Expressions of Interest. · Request audited financial statements and mining portfolios. · Assess bidders' track records and technical and financial capacity.
	Without prequalification: · Allows any type of investor to participate in the process. · Reduces the administrative costs of evaluation in the bidding process.
Design of the bidding process	Thorough: · Prepare the tender documents: product, areas, and projected returns. · Determine the process and criteria based on the legal framework. · Compile geological and geophysical data. · Assign design to a government agency or independent party. · Use experts to assess the bids.
	Simplified: · Scant or no information on the mining resource to be explored/ exploited. · Little delineation of priority mining areas or products. · Low investment in studies of markets and production cycles for the minerals to be offered.
Advertising the bid	· Tender briefing session, published and streamed online. · Tender documents shared with prequalified investors (where a prequalification process has been conducted) or at the briefing session. · Competition advertised domestically and internationally.
Conducting the bid	· Managed either by a government agency or a third party. · Bids received electronically or in person. · Evaluation of the bids once the stipulated amount of time has elapsed. · Mechanism or direct negotiations to break ties. · Bid annulment if the process criteria are not met.
Design of the bidding process	· Winning bid is awarded the mining license. · Result officially communicated to bidders and the public. · Legislative approval, where required. · Request for previous studies and start of contract negotiations.

Note: Phases shown in orange are essential for designing a competitive bidding process, while those in blue are adjacent to the bidding process.

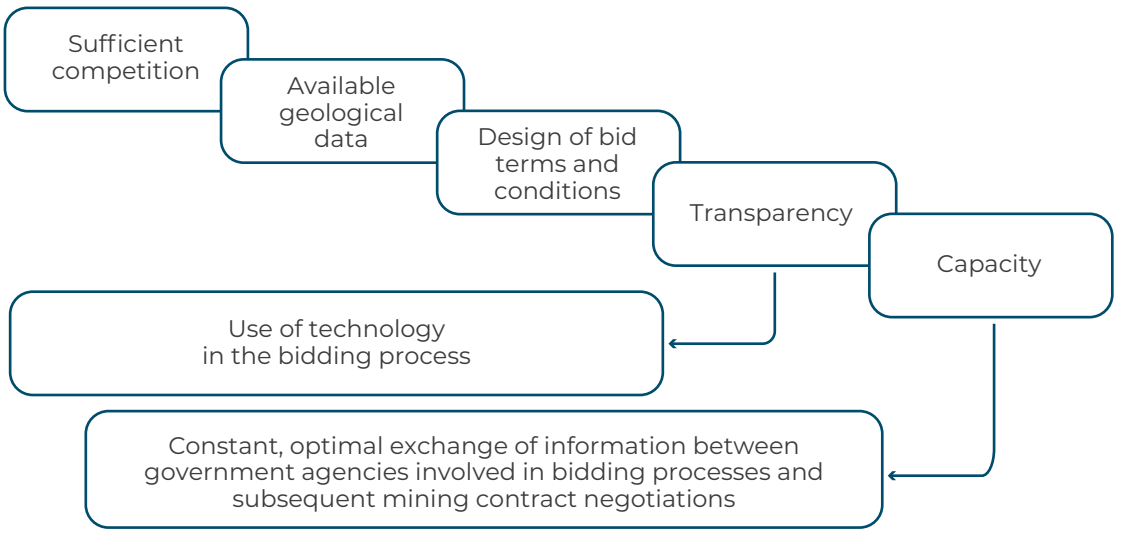
2.3. Success Conditions, Benefits, and Risks Associated with the Competitive Bidding System for Allocating Mining Licenses

This section presents the success conditions, benefits, and risks associated with the use of competitive bidding to allocate mining licenses. It serves as a theoretical framework for Section 2.4, which analyzes the experiences of Brazil, Colombia, and Suriname. The study assesses factors for successful competitive bidding, such as sufficient competition, the quality of geological information, transparency, institutional capacity, and the use of technology. It also address its benefits, which include higher revenue and investment, fewer information asymmetries, lower corruption, and more efficient allocation. Lastly, we explore risks such as collusion, corruption, and limited participation.

Conditions for Success

Based on the information in Readhead et al. (2023), five general conditions for success have been identified, in addition to two specific conditions detailed herein, all of which are of particular importance for conducting effective competitive bidding (Figure 2.1 and Table 2.3).

Figure 2.1. Conditions for the Success of Competitive Bidding



Sources: Authors' elaboration based on Readhead et al. (2023).

Table 2.3. Detailed Description of the Success Conditions for Competitive Bidding Processes[7]

Sufficient competition	Available geological data	Design of bid terms and conditions	Transparency	Capacity	Technology	Communication between government agencies
Attract multiple bidders. Improve the quality of proposals. Government benefits from a variety of offers.	Provide detailed geological data. Ensure an accurate assessment of the resources. Attract serious investors.	Set balanced, realistic terms. Avoid bids that are overly optimistic or unrealistic. Safeguard the project's long-term viability.	Make information public. Minimize political interference and corruption. Ensure equal treatment for investors and maintain their confidence.	Use government capacities to manage the process. Use external experts when necessary. Ensure that bidding rounds are efficient and effective.	Use high-quality technology. Ensure accessibility for multiple participants. Facilitate accurate data management and participation.	Maintain coordination between public agencies. Align studies, decision-making, and contract negotiations. Ensure continuity of the process, from the study phase through to the mining contract.

Sources: Authors' elaboration based on Readhead et al. (2023).

Benefits of Competitive Bidding Processes for Allocating Mining Licenses

In terms of the benefits of competitive bidding, this method offers at least five clear advantages, consistent with those mentioned in the earlier discussion of the differences between competitive bidding and the first-come, first-served method.

Reduces information asymmetries

Competitive bidding gives governments access to additional information that different potential investors possess regarding the commercial viability of a mineral resource. Given their experience and interpretation of the geological data provided, investors have an incentive to submit their best offer. This gives the State more precise information about the value of its resource, thus bridging the information asymmetry that is typical of direct bilateral negotiations. In such negotiations, the potential investor usually has more information and can use it to obtain concessions and fiscal incentives from the government.

Increases investment

As an open process with international visibility, competitive bidding can increase investors' interest in a mining jurisdiction.[8] Because it provides a transparent, competitive framework, it attracts participation by a greater number of companies. In addition, knowledge of the characteristics of the mineral allows the State to compare its quality with other markets and estimate the required levels of processing or refining in the upstream phase. This could lead to new bidding processes for infrastructure or to facilitate transportation and export of the mineral.

Increases government revenue

Competitive bidding can increase government revenue in several ways:[9]

- Monies paid by all bidders, such as bidding fees.
- The financial components of a bid, such as a signature bonus.
- Increased revenue from royalties or other fiscal instruments if the State selects a preferential method of calculation or introduces new royalties arrangements for areas of special interest, such as critical minerals.
- Increased profitability of a mine from the selection of an investor who can optimize the deposit and maximize earnings.
- Utilization of any byproducts identified when studying the deposits, including accurate estimates of their quality and price.
- Reduction in environmental costs and community management expenses, as these challenges are anticipated from the outset, thus avoiding any need for a reassessment of expected returns during execution of the concession contract.[10]

Discourages concession sitting

The prequalification stage of competitive bidding can weed out investors who have no technical and financial capacity to develop the resource. This prevents concession sitting, where unqualified investors take up licenses for speculative reasons rather than to develop them. To reduce this risk, the authorities can impose minimum work programs, annual increases in surface fees, and an obligation to reduce inactive areas. These measures ensure the commitment of capable investors participate, fostering more efficient and responsible mining development.

Reduces the risk of corruption

Competitive bidding is premised on the use of transparency to allocate mining licenses. An open process, accompanied by oversight mechanisms and with public access to tender documents and process results, is preferable to a situation in which the State waits for the investor's terms. Active management by the State helps to reduce discretionality, while limiting opportunities for collusion and corruption. Transparency also ensures a fair, equitable process, thus helping to build trust among investors.

Risks of Competitive Bidding Processes for Allocating Mining Licenses

As this method is not yet widely used in LAC, the State's management of competitive bidding may be subject to additional risks. These risks are like those in other mining allocation systems and are the product of its implementation, rather than the structure of the system itself. Accordingly, they should be considered, but not as inherent disadvantages of using this system.

Collusion

Bidders can conspire to fix the winning bid, and this risk is higher in ascending bids where offers are visible. Bidders can also use intermediaries or shell companies to hide their connection to one another and create the illusion of competition (OECD, 2016). To mitigate these practices, the bidding process should require prospective investors to disclose business relationships, while also incorporating rules to discourage collusion. Other measures include the use of closed bids (where offers are not made publicly) and the imposition of penalties, such as banning bidders that have taken part in collusion from participating in subsequent bidding processes.

Corruption

Competitive bidding can be affected by corruption, particularly where the licensing round is supplemented by direct negotiations. These facilitate bribery and fraud due to a lack of transparency and possible discretionary powers on the part of government officials.[11] Corruption can still occur in the absence of direct negotiations if a government official passes privileged information to one of the bidders to help them win the auction (OECD, 2016). Conflicts of interest are another potential problem, such as when a government official has an ownership stake in a company that is participating in the bid (Sayne, Gillies, and Watkins, 2017). To prevent corruption, the bidding process must be transparent, with public access to tender documents and bid results, as well as robust oversight mechanisms.

Low participation from junior companies

Auctions can lock out junior companies that have the technical capacity to develop a resource but may be outbid by large companies. Some countries allow for joint bidding, where bidders can work together to develop the resource. Others do not, for fear of collusion or reduced competition. Angola, for example, requires investors to indicate whether they want to participate as the operator of a joint venture to develop the resource (Tordo, Johnston, and Johnston, 2010). This approach can help to ensure the inclusion of smaller companies and diversify competition.

Low competition

Low competition reduces the efficiency and effectiveness of a competitive bidding process. Although there is no ideal number of bidders, a minimum of three qualified participants is recommended. If the first round fails to attract this minimum number, some countries allow a second round. If this also fails, the auction can proceed with fewer than three bidders. In LAC, however, the process usually involves just one round. If there is just one bidder, the auction is declared void, or the low level of interest is analyzed before relaunching the bid.

Common causes of low participation include inadequate advertising, unattractive financial conditions, the risk of expropriation, political instability, and weak governance (Stanley and Mikhaylova, 2011). These risks can be mitigated through sound design, satisfactory implementation, and effective oversight of the process.[12]

2.4. Practical Application of Success Conditions in Competitive Bidding Processes for Allocating Mining Licenses

Based on a review of the literature and interviews with government officials, this section examines whether competitive bidding processes in the mining sectors of Brazil, Colombia, and Suriname been successful according to the conditions for success discussed in Section 2.3. These experiences point to different levels of development, with some countries in the early stages of model implementation and others in which it is a recurring process.

In the interests of clarity, a summary is provided of the experience of each country. Thereafter, examples of the implementation of the success conditions are listed, including the method of their adoption. Lastly, the benefits and limitations identified are analyzed to provide a comprehensive overview of outcomes in the region.

Context for the Experience of Each Country Analyzed

Box 2.1. Legal Regimes Governing Competitive Bidding in Brazil, Colombia, and Suriname

Brazil[13]

Brazil has adopted a mixed system for awarding mining licenses that combines the traditional first-come, first-served model with competitive bidding processes. This reform has sought to improve the management of underutilized areas, while also including additional economic contributions for participating in the process. The arrangements provide for a minimum financial component of R$1,012, payments of R$1,472 for the transfer of mining rights, and additional fees for exploration and exploitation activities.[14]

Both amounts are below those usually required in competitive bidding processes driven by revenue objectives, where emphasis is placed on a financial component focused on maximizing mine profitability. For example, the Serviço Geológico do Brasil (Brazilian Geological Survey, or SGB) (formerly the Companhia de Pesquisa de Recursos Minerais, or CPRM),[15] organizes the award process for areas assigned to it in the 1960s.[16] The SGB focuses on allocating mining concessions to bidders who offer the greatest returns, based on royalty payments to the State.[17]

The SGB's bidding process only covers the areas that were assigned to it and for which it has the power to create a special regime.[18] This does not affect other areas, which are under the direct management of ANM-Brazil. In these cases, the competitive bidding model focused on the reutilization of available areas takes precedence as long as there is more than one bidder. Failing this, the area reverts to the traditional model in which the allocation is made to the first bidder (in this case, the only one).

(*continued on next page*)

Box 2.1. Legal Regimes Governing Competitive Bidding in Brazil, Colombia, and Suriname (*cont.*)

Colombia

Colombia has introduced a system of competitive bidding rounds for allocating mining licenses. This began in 2021 with the Ronda del Oro (Gold Round).[19] This regulated process covers several points in the mining value chain and is supported by legislation that allows an alternative, more flexible approach to mining management than the processes stipulated in the 2001 Mining Code. (The latter has regulated mining activity in the country since the 1970s.) Strategic Mining Areas (AEMs) have been created as a focus for development efforts, and the use of competitive bidding processes has centered on these areas. Monetary compensation is received in addition to royalty payments, as authorized under Article 20 of Law 1,753, 2015.

The Colombian system is highly developed and highly centralized, with one entity managing the entire process—the National Mining Agency (ANM-Colombia), supported by the Colombian Geological Service (SGC, formerly INGEOMINAS) and the Mining and Energy Planning Unit (UPME). The latter entities contribute to the process by managing geological data and conducting general planning for all issues relating to the mining sector.[20] Three ANM-Colombia units participate in the process, from the bidder evaluation stage through to signing of the contract after it has been awarded. The rounds are proposed based on the type of product there is interest in developing: gold, coal, copper, or phosphates.

Suriname

Suriname is at an initial stage in its implementation of competitive bidding processes for mining. Mining sector reform in the country is aimed not only at adapting the concession process to the competitive bidding model, but also at conducting a full review of current mining legislation and the method of awarding licenses.[21] The country has delegated the task of designing the competitive bidding process to an evaluation committee, and this has determined how the model should be applied, particularly in the bauxite and gold extraction sectors.

Although the method and conditions of auctions are not yet fully defined, the government's position in current negotiations reflects the measures it plans to implement soon. The objective of this comprehensive reform is to modernize the regulatory framework and ensure more efficient and transparent management of the country's mineral resources.

Conditions for Success

Based on the criteria in the theoretical framework, we review how the conditions set out in Section 2.3 are reflected in the sample bidding processes from different countries in the region.

Sufficient competition

One of the factors common to the countries analyzed is the need to attract multiple bidders rather than depend on a single or small group of investors that are thought to be the only ones interested in natural resource extraction. This perception increases investors' leverage in negotiations (as in the case of Suriname regarding the extraction of bauxite and associated byproducts). The continuous involvement

of such investors—based on rules that had remained mostly unchanged since the 1970s and 1980s—has created an unbalanced relationship between the State and investors, giving the latter excessive control over the terms of investment.

One example has been the relationship between Suriname and the Aluminum Company of America (Alcoa). The Dutch colonial government originally granted Alcoa a license, which remained in force until 2015, and this allowed the company to position itself as the sole concessionaire for the extraction of bauxite, alumina, and aluminum in the country. From 1911 to 1916, Alcoa was engaged in discussions to obtain a license (Lamur, 1983), and this effort was ultimately successful. Following approval of the license, the company based itself on the banks of the Cottica River in the Moengo region, developing an operation that included the construction of a hydroelectric plant. The process was characterized by violations of the rights of local communities and environmental impacts that had harmful effects on the region (Lobach, 2023).

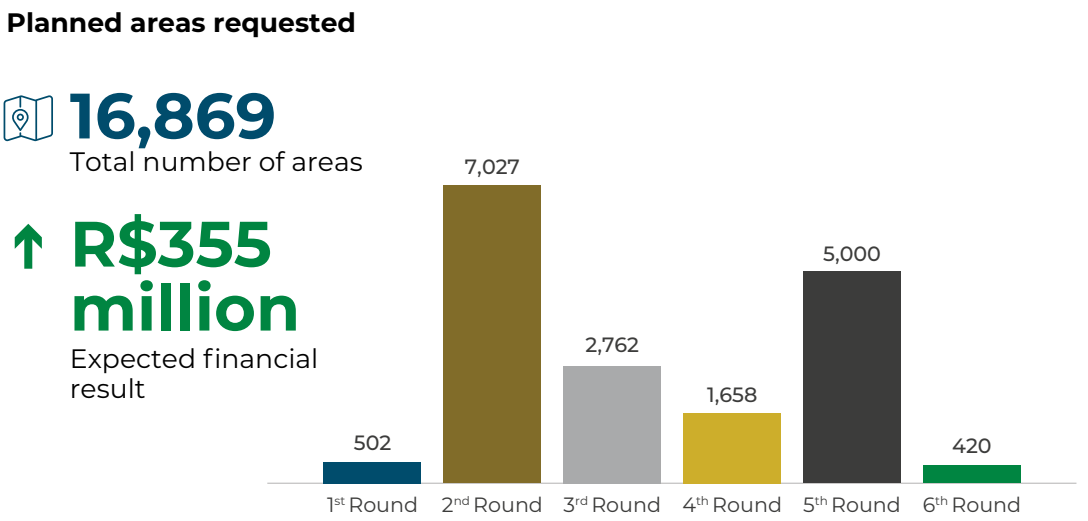
The power accumulated by Alcoa in the period prior to Suriname's declaration of independence from the Netherlands allowed the corporate giant to continue exploiting the various minerals and, at times, to act in ways that were damaging to the country. Such harm was difficult to counteract through government strategies alone (Lobach, 2023). Alcoa in fact made the decision to end its involvement in Suriname, abandoning the mine in 2015 and claiming that the quantity of reserves was insufficiently attractive to continue operating in the country unless the government established a new agreement satisfactory to its interests. This led to a discussion lasting at least three years, during which no agreement was reached to continue with the mining project. Following this experience, the Surinamese government decided to alter its approach. It created a management committee, known as the Presidential Commission for Development in Suriname, which since then has been responsible for exploring the possibility of offering this project to other investors. The Commission also studies the terms that would be most favorable for the authorities when developing future mining operations.

Similarly, Brazil found that multiple mining areas in the country were not being exploited by offerers that had voluntarily requested mining licenses from the State. This situation arose partly because "free areas" (i.e., those not used for mining activity) had not been fully delineated from "available areas" (i.e., where preliminary work had been undertaken but the company responsible for exploration or exploitation had abandoned the site or the license had expired).[22] Accordingly, the country decided to introduce a new procedure to create a mixed system alongside the first-come, first-served model. This would focus on new investors and put up for auction the vast number of areas that remained unexploited in the hands of the State (de Mattos Silva, 2019). This procedure offered a considerable number of areas that were ready for exploitation and for which geological composition data was available, suggesting a prosperous future for natural resource extraction.[23]

In addition, a provisional measure was issued in 2017 creating ANM-Brazil,[24] with responsibility for managing mining activity and resources. As ANM's functions included the creation of a system for public competitive bidding,[25] it assumed responsibility for the process of auctioning areas that either had sufficient geological information to estimate the potential value of the license or, alternatively, had become available because an investor had decided to withdraw from further investment.[26] The objective of this new model was to make use of lands suitable for exploration while exerting greater control over the areas included in ANM-Brazil activities at the national level.

The Brazilian government indicated that the failure of traditional methods to offer certain territories more actively resulted in missed opportunities, and thus updated the regulations governing the allocation of mining licenses, leading to the introduction of competitive bidding processes.[27] These processes began in 2020[28] and have been beneficial for the authorities in that they have yielded significantly better results than first-come, first-served models. Brazil is now holding the eighth bidding round (Figure 2.2).

Figure 2.2. Allocated Areas in Brazil and Resources Expected by the Country



Source: William Freire Advogados Associados (n.d.).

These auctions are not the only ones available in Brazil, as the Brazilian Geological Survey (Serviço Geológico do Brasil, or SGB) has also developed competitive bidding processes for areas assigned to it before it was converted to a state-owned company.[29] The SGB performed geological studies in the 1970s and 1980s to confirm the mining potential of these areas, which were found suitable for exploitation.[30] Accordingly, these areas were the subject of bidding processes focused on raising revenue for the Brazilian government. The SGB began to offer these areas from 2019 onward, with evaluation criteria placing the greatest weight on the financial offer, followed by technical management.[31]

The SGB offered five projects that required bidders to offer a signature bonus in exchange for the allocation of mining rights, in addition to legally required royalty payments. The latter are known in Brazil as the Financial Compensation for the Exploration of Mineral Resources, or CFEM. They were introduced in 1988, and later modified by Law 13,540 of 2017.[32] The signature bonus was set at R$15 million (approximately €2.462 million), which the winning bidder must pay in three installments: 10 percent prior to signing the preliminary contract for the assignment of mining rights; 40 percent prior to signing the final contract for the assignment of mining rights; and the remaining 50 percent within 10 days of the publication of the first mining concession for the assigned mining rights. The minimum royalty value was set at 1.7 percent of gross earnings from the sale of mineral products, with the possibility of adjustments subject to the provisions of Law 7,990/89 relating to calculation of the CFEM (William Freire Advogados Associados, n.d.).

The competitive bidding project managed by SGB therefore focuses on obtaining economic resources for the State, which are paid immediately. It also uses performance guarantees that benefit the State in advance.[33] The model, which was introduced one year before the general model used in the areas reported by ANM-Brazil, has—to a degree—established a mixed mechanism between direct allocations and allocations based on competitive bidding processes.[34]

In the case of Colombia, the objective is to attract foreign investors by studying the terms of public tenders for mining license allocation in other jurisdictions. According to the interviewee from ANM-Colombia, the Vice Presidency for Promotion and Development is responsible for studying the market conditions for each mineral put out to tender, so as to ensure that content of the bidding documents is sufficiently attractive to global investors.[35]

In terms of the historical background, Law 1,753 of 2015 introduced the concept of Strategic Mining Areas (AEMs), which allowed the national mining authority to designate areas containing reserves deemed strategic in nature. Article 20 of Law 1,753 states that such areas will be classified as AEMs where the type of mineral is identified as being of strategic interest.[36] Likewise, Article 20 stipulates that the SGC will determine the types of analysis that must be carried out to identify these areas,[37] and that ANM-Colombia will be responsible for developing

competitive selection processes. This gives ANM the freedom to choose minimum participation requirements, evaluation criteria, special obligations on the part of the concessionaire, and minimum financial contributions (in addition to royalties).[38] The legislation also states that for areas not designated as AEMs (known as free areas), concessions may be granted under the ordinary regime of the Mining Code.[39] Similarly, it states that where there are no bidders for a concession, ANM-Colombia may retain the area for tender in a future selection process, without prejudice to the ability to alter its destination at any time.[40]

Article 20 of Law 1,753 thus granted ANM-Colombia broad regulatory powers over the bidding process, which—as in the case of the SGB—was aimed in the first instance at obtaining greater economic resources for the State (in addition to mining royalties). Improving the technical management of mining operations in the country was the second criterion. ANM-Colombia Resolution 150 of 2021 stipulates the stages of the bidding process and regulates its terms.[41] As additional compensation, the Resolution provides for a quarterly payment to ANM-Colombia by the winning bidder, equivalent to a share of the value of the production at the mineshaft calculated on the total volume produced for all the minerals extracted within the awarded area.[42] This compensation is calculated as the volume of mineral produced multiplied by the base price for the settlement of royalties (set by the Mining and Energy Planning Unit, or UPME) and the percentage share offered by the successful bidder or counterbidder.[43]

The financial criterion may be used as a tie-breaking mechanism when two or more bids receive the same score. In such cases, preference will be given to the counterbid with the highest proposed additional compensation. However, other criteria may also be applied, such as a higher score for the Additional Exploratory Program or faster submission of the counteroffer.[44]

Regarding competitive bidding in Brazil and Colombia, multi-stage processes have been developed that consist of several sequential phases (in addition to the community notifications and public hearings that must be carried out). The stages are as follows:

i. Prequalification
ii. Geophysical data made available to bidders[45]
iii. Publication and advertising of bidding documents (known as "auction notices" as “editais” [auction notices] in Brazil and “objective selection documents” in Colombia)[46]
iv. Opportunity for questions or requests for clarification
v. Initial offer process in which bidders are asked to confirm their intention to participate in the auction for one or more available areas (known as "public meetings/consultations" in Brazil and "call for bids" in Colombia)
vi. First bidding round

vii. In the case of the SGB process in Colombia only,[47] a second round of bidding involving counteroffers[48]
viii. In the case of Colombia only, an opportunity to submit an improved offer[49]
ix. Lastly, publication of decision regarding the winning bidder for each area

Available geological data

The State should focus its initial efforts on developing mining studies that accurately identify the value of mineral resources under its control. These geological or exploratory studies are essential for determining the type of mineral, its quality, and the risks associated with its exploration and production.[50]

Accurately identifying the value of a resource not only makes it easier to offer an area for auction but also allows the State to negotiate favorable terms during the license allocation process (Cameron and Stanley, 2017). This preparation not only helps to build an attractive bid package but also ensures that the winning bidder has the capacity and willingness to meet the objectives set by the State. In addition, obtaining geological information before the license allocation stage adds value to the process by allowing the authorities to become familiar with the available areas and their potential for future exploration or exploitation.

The experiences of Brazil and Colombia have demonstrated the importance of gathering data on areas of interest and the products and byproducts that can be exploited. In Brazil, when determining the process to be followed, ANM-Brazil distinguishes between allocated areas, free areas, and areas that have been returned to the State.

Those in the latter category have prior studies and geological data and therefore follow a competitive bidding process. The same is true of free areas for which significant geological information is available, particularly where these contain critical minerals. In contrast, when insufficient information is available on a resource or its value, investors are permitted to request direct allocation based on the first-come, first-served model, as a complementary mechanism.

In the case of Colombia, collecting information on areas for possible exploration and exploitation is crucial for developing each round, the processes of area studies, competitive bidding, and subsequent allocation, based on the work of three government divisions responsible for carrying out each of these processes.[51] Competitive bidding rounds in the country have been managed according to the type of products and byproducts offered. The initial offering centered on gold exploitation, followed by products such as copper, coal, and phosphates. Given the objective of generating interest among investors from around the world (as well as investors already established in the country), each of these auctions has been preceded by painstaking preliminary research into the types of product found in the country and how these fit into global markets.[52]

In Suriname, this work has evolved based on discoveries and information obtained in cases.[53] An example is the bauxite and aluminum extraction project developed by Alcoa (see the discussion of conditions for success in Section 2.4). The State also gathers information on the work methods of small and medium entrepreneurs in the gold exploitation sector (Stichting Planbureau Suriname, 2021).

Design of bid terms and conditions

Balance in bidding terms and conditions is essential for ensuring successful auctions. Colombia's experience highlights the importance of addressing the topic not only from a technical standpoint, but also a commercial one. It is crucial that the authorities understand the investors' perspective so that they can anticipate possible challenges and determine conditions for success that can be sustained over time, thus ensuring that an investment is productive.

During the interview with ANM-Colombia, it was pointed out that the likelihood of receiving multiple proposals declines if the bid package is not based on sound preliminary research. This can result in a single bid that does not meet the requirements, causing the auction to fail. This was the case in the round for phosphates, which attracted just one bidder and led ANM-Colombia to reevaluate the production chain for this mineral. The conclusion was that international demand is focused on countries that not only mine phosphates but also process them locally. These jurisdictions therefore enjoy a better market position.[54] This discovery allows the Colombian authorities to determine whether there is a better way to offer this product, while also comparing its quality with that of other jurisdictions. This enhances the chances of developing competitive offers that attract global investors.[55]

Brazil and Suriname have acknowledged the importance of conducting research before designing the bid package, so that the challenges and risks associated with the production chain of the mineral being auctioned can be analyzed. Both countries understand that an adequate assessment of resources improves their attractiveness to investors. In the case of Suriname, recent efforts have focused on gold, bauxite, and aluminum or alumina. The annual development plan for 2022–2026 includes studies of the incremental changes being made at the legal and administrative levels in relation to gold (Stichting Planbureau Suriname, 2021, p. 83).

Transparency

Transparency is a fundamental pillar of competitive bidding processes, particularly where the allocation of mining licenses is concerned. It is crucial that information on the bidding round be available to the public, as this reduces political interference in the process and minimizes the risks of corruption, illegal practices, or asymmetry in the information received by bidders. By ensuring that investors all have access to the same information, participation is encouraged, and the best possible proposal is obtained from each one.

The competitive bidding process benefits from acting as a prelude to any direct negotiations with the winning bidder for the area. This ensures that contact does not occur without a previous competitive environment in which the bidder must outperform the technical and economic proposals of its competitors.

A clear example of the importance of transparency is provided by Colombia, where an auction with just one bidder (even though the relevant information had been shared publicly) demonstrated that the problem was not a lack of interest, but rather an unattractive bid package for the product offered. Similarly, in the case of Brazil, the competitive bidding system is conducted electronically, and ANM-Brazil issues a public resolution that establishes terms and conditions that are shared equally with all potential investors. During the seventh round, however, a technical problem with the electronic platform raised doubts as to whether participants had received equal treatment. Given this uncertainty, the decision was taken to cancel the round and restart the process from the beginning. This demonstrated the authorities' commitment to transparency and equity in the bidding process.[56] A transparent, public process is expected in Suriname, although certainty on this point will only be possible once the relevant laws have been issued.

Capacity

State capacity is crucial for the success of competitive bidding in the mining sector. However, technical ministries in some countries lack sufficient resources to review proposals and manage the bidding process; as a result, these functions are often delegated to other government agencies or divisions. This delegation is a factor for success, as the interest generated by a bid package is dependent on satisfactory government management. Accordingly, it is crucial to have effective management not only of bidding document preparation, but also the entire bidding process and the bid evaluation stage.

The three countries analyzed use experts in the fields of economics, geography, and technical evaluation, as evidenced using national or regional mining agencies. In the case of Colombia, the interview established that ANM-Colombia is divided into four vice presidencies, three of which are directly involved in the bidding process—from the studies carried out to support preparation of the bid package to agreeing the contract with the winner of the bidding round. These vice presidencies are as follows: (i) Promotion and Development, which carries out data studies, gathers information for the bid package, and prepares an initial draft of the future contract;[57] (ii) Procurement and Titling, which manages the mining contract with the bid winner (or winners, where several areas are offered during the round); and (iii) Monitoring, Control, and Mining Safety, which monitors the investor's ongoing work.

In the case of Brazil, the entire process is managed by ANM-Brazil, which replaced the former National Department of Mineral Production (Departamento Nacional de Produção Mineral, or DNPM). The Authority also manages competitive bidding processes, negotiation, and mining area allocation at the national level. This responsibility is established under Law 13,575 of 2017, which gives ANM-Brazil the power to make decisions regarding federal regime under the special regime for the allocation of mining licenses. In some mining areas, the SGB is responsible for the process.

In the case of Suriname, the main actor in the decisions to be made soon is the Ministry of Natural Resources, as administrative decisions are still being made regarding the entities that will be involved research, launch of the bidding process, and subsequent negotiation of the mining title.[58] Although it has not been reviewed as a case study, it is worth mentioning the experience of the Argentine province of Salta, where the complete competitive bidding process, including the evaluation stage and subsequent negotiation with the winning bidder (Box 2.2).

Box 2.2. Lithium Extraction Sector Example

The Argentine province of Salta has identified a development opportunity within the legal framework of the Argentine Mining Code, which gives provinces the power to conduct competitive bidding processes if they follow certain basic guidelines.[59] In response to this authorization, Salta established the majority state-owned company Recursos Energéticos y Mineros de Salta S.A. (REMSa), which is authorized to conduct the bidding processes that fall within the province's jurisdiction, pursuant to Article 29 of Mining Procedure Code of the Province of Salta. Its president leads the initiative, which is aimed at promoting economic and social development in the region.[60]

The province—which together with Bolivia and Chile is in the "lithium triangle"—has significant lithium reserves in its salt flats, representing a strategic opportunity for mining development (Ministry of Economy of the Argentine Republic, 2023). The Salta Mining Agency has focused on leveraging this natural wealth through a competitive bidding process designed to attract investment and maximize economic and social benefits for the region. This approach demonstrates Salta's capacity to effectively manage auctions for its mining resources, aligning itself with best practices and taking advantage of its privileged geographical position in the global lithium market.

Use of technology in the bidding process

Tenders are advertised in Brazil through public broadcast and the process is carried out directly through the Public Offering and Auction System for Mineral Areas (SOPLE),[61] which has a public web portal.[62] The entire process is conducted online. including the auction stage (wherever there is more than one bidder at the initial offer stage),[63] as well as the stage covering any appeal of ANM-Brazil's decision on the winner of the process.[64]

In Colombia, this process has also been developed with the support of the special section for AEMs within ANM-Colombia's web platform.[65] In addition, the use of new technologies has been expanded for generating smart contracts, and blockchain technology has been incorporated to ensure information security, transparency, and traceability of records.[66]

During the bidding process, where unforeseen circumstances call the accuracy or transparency of the system into question, the response of the ANMs in both Colombia[67] and Brazil[68] has been to cancel or suspend the bidding process to assess the situation. In the case of Suriname, the details of the bidding process and how it will share the tender documents is still being determined.

Constant, optimal exchange of information between government agencies involved in bidding processes and subsequent mining contract negotiations

As mentioned in the discussion of administrative capacity in Section 2.4, both Colombia and Brazil have specialized agencies to manage competitive bidding for the allocation of mining licenses. In Colombia's case, management responsibilities are clearly defined through the vice presidencies that handle each stage of the process: auction, allocation, contract signing, and subsequent oversight. Similarly,

ANM-Brazil manages all mining allocation processes for the country's federative units through its different departments. The approach to be taken in Suriname has also yet to be decided.

Benefits

This subsection evaluates whether bidding processes in Brazil, Colombia, and Suriname have yielded benefits.

Income generation

This subsection has two objectives: (i) to explore whether the governments of Brazil, Colombia, and Suriname have used competitive bidding to increase mining revenues (e.g., through higher royalty rates or additional tax payments) and (ii) to provide observations on the specific benefits identified in the case studies, based on the key elements set out in Section 2.3. (As these processes are still at too early a stage to draw definitive conclusions, our observations are preliminary in nature.) Table 2.4 summarizes the main sources of revenue from the bidding processes undertaken to date in Brazil, Colombia, and Suriname.

Table 2.4. Main Revenue Sources Associated with the Implementation of Competitive Bidding Processes for Mining License Allocation in the Countries Studied

Potential revenue source	Brazil	Colombia	Suriname
Cost of purchasing bidding documents or access to information on areas	No, information is only shared with bidders who participated in the first public meeting, who must request it from the relevant authority (generally the SGB or ANM-Brazil,[69] but alternatively designated by means of an order) (ÍGNEA, 2024; ANM-Brazil, 2023).	Yes, payment to the SGC for access to the data room.	To be determined when the relevant policy is prepared.
Signature bonus	The revenue generated by the initial auctions was under R$300 million.[70] Nonetheless, signature bonuses are payable after the winners of the round have been notified. Each selected bidder must pay the full amount of their bid before signing the mining contract.[71] Failure to comply with this obligation may result in fixed fines or fines of 20 percent of the bid amount, suspension of the participant from future processes for 2 to 5 years, or invalidation of the auction.[72] A signature bonus is also charged for areas offered by the SGB, in addition to an advance payment of 50 percent of the bid amount upon signing the preliminary contract for the assignment of mining rights and prior to the final contract.	No signature bonuses are reported.	To be determined when the relevant policy is prepared.

(*continued on next page*)

Table 2.4. Main Revenue Sources Associated with the Implementation of Competitive Bidding Processes for Mining License Allocation in the Countries Studied (*cont.*)

Potential revenue source	Brazil	Colombia	Suriname
Increase in mining royalty rates or other significant fiscal levies provided for in the bidding terms	The competitive bidding process has not led to increases in royalties or any other direct changes to these taxes. In 2020, the CFEM yielded a record R$6.1 trillion in revenue (Ministry of Mines and Energy, 2021).	Royalties continue to be collected in accordance with the Mining Code, Law 141 of 1994, and the Constitution, as well as the rules established by entities such as the UPME. However, payments for additional compensation are also reported, and these are calculated based on similar criteria to those for royalties. This additional compensation is not a tax, but rather a source of income that supplements tax payments.	The government intends to use the bidding process to negotiate a state participation regime (or shared participation in bauxite production), instead of the predetermined tax and royalty regime.[73]
Improved mine profitability	This has not been identified in this report, but it is reasonable to assume that the exploitation of a mineral deposit will be optimized by selecting the most financially and technically capable investor, thus increasing potential overall revenue from a project.	The additional compensation described in the subsection of Section 2.4 will be the result of increased mine profitability. Its impact will therefore be confirmed in future, once the recently auctioned areas enter the exploitation stage.	Policy is still being defined in the country, and it therefore too early to assess these benefits.
Use of byproducts	This benefit was not identified in the interviews conducted.	This benefit was not identified in the interviews conducted.	This benefit was not identified in the interviews conducted.
Reduction in environmental costs and community management expenses, which usually diminish the investor's ability to pay once activity has begun	No records were found of direct benefits arising from competitive bidding, but we understand that the State holds public consultations as part of these processes. This was clear in the context of auctions carried out by the SGB.[74]	No direct evidence was found linking the bidding rounds to a reduction in environmental or social costs. However, the auctions are often associated with strategic products included in the national development plan, suggesting that increased mining revenue is consistent with sustainability objectives and strengthening of the social rule of law.[75]	The process is still at an early stage, but the Surinamese authorities are very interested in resolving issues related to the mining sector. Accordingly, they want to integrate communities into the sector to prevent unemployment rates from rising, while increasing the development of transferable skills for those working in existing areas.

Source: Authors' elaboration.

In summary, competitive processes for allocating mining licenses can increase public revenues by allowing the State to regulate additional financial contributions (separate from royalties), as offered and counteroffered in auction rounds. Such contributions are feasible when established in this way, as in Colombia and partly in Brazil (either through the SGB, with higher amounts, or ANM, based on the number of areas offered and the signature bonus payments).

As regard the second point to be discussed in this section, the following observations can be made:

- In Brazil, it has been established that the competitive bidding process has generated some revenue for the government, in the form of signature bonuses. For example, in the results of the round held in 2021, 2,762 areas were allocated, with each one attracting payments ranging from R$1,012 to R$1,222,000.[76] This is even before considering the higher values potentially generated by the CFEM.[77]
- In Colombia, no benefits have yet been generated by competitive bidding processes as their implementation is still too recent.
- The process in Suriname is still at the design stage, and, consequently, no financial benefits have yet accrued to the government.

Other benefits

According to the interviews conducted, the availability of detailed geological data from the outset has allowed Brazil, Colombia, and Suriname to better comprehend the type, quality, and quantity of the resources offered. This has been a result of additional information requested from investors, such as price reports and technical studies. If the relevant agencies share this information with the tax authorities, this capacity reduces the risk of transfer pricing abuse and base erosion.

Competitive bidding has also served as a framework for resolving complex technical issues in these countries, as it allows obligations and rights to be defined during the investor selection and contract negotiation stages that provide guarantees to both parties. In Colombia, for example, this process has helped to address issues such as mine closure and the prevention of situations in which allocated land is left unexploited.[78]

Assessing the technical and economic capacity of investors from the outset significantly reduces the risk of allocating a license to one that is unable to develop the resource, and it allows the State to grant areas in proportion to an investor's capacities. In addition, knowledge of the market for the product (which is needed to prepare the bid package) means that the authorities can anticipate risks and determine management conditions that ensure license objectives are fulfilled.[79]

Risks and Limitations

Interviews conducted in the countries analyzed did not reveal any cases of corruption or collusion associated with competitive bidding. On the contrary, interviewees underlined that the use of electronic platforms significantly reduces such risks. The digital publication of bids curtails manipulation, while well designed bidding documents reduce subjectivity, thus ensuring a fair and transparent selection process.

In the three countries analyzed, it is acknowledged that not all investors have the same technical and financial capacity or risk level. Accordingly, the possibility of allocating areas using traditional allocation models or smaller-scale mining arrangements remains, as these are more accessible to small and medium enterprises. In Brazil, for example, areas that receive no bids can be directly reallocated if they remain vacant. In addition, competitive bidding serves as a means of assessing demand, providing an initial reading on the viability of an areas. The process led by ANM-Brazil adopts an inclusive approach by auctioning multiple areas and setting minimum values accessible to all types of bidders.

In the case of Colombia, low competition has encouraged ANM-Colombia to reassess conditions for in the domestic economy before reopening the round.[80] Each bidding process requires a comprehensive assessment of the global market for the product, the quality and quantity of the resource (based on geological studies), and domestic or international processing options. If this assessment is partial, the bid package may not match investor expectations. In this case, the State may cancel the round and adjust the tender, or it may decide to use another allocation mechanism.

The experiences of Colombia and the SGB in Brazil show that competitive bidding—under conditions of transparency and with technical support from the authorities—can attract investors who are prepared to compete for mining areas. This highlights the importance of informed management for the success of the process.

2.5. Conclusions and Recommendations

It has generally been the case that countries that initiate legal reform processes tend to consider the introduction of competitive bidding a desirable means of allocating licenses for mining resources that are of high value to their economies. In some cases, these resources are in high demand and are therefore frequently referred to as "strategic."[81] Developing new legislation for the mining sector tends to alter the way licenses are awarded and the value chain is managed, with the State taking a more active role in allocating areas and negotiating contracts, based on accumulated experience over the last ten years.

In terms of enhancing revenue, the introduction of bidding fees and immediate payments after the winning bidder has been selected are ways to ensure that revenue increases, as discussed in the subsection on benefits. Another way of achieving this is through mining royalties; this option is being studied in Brazil under the presidency of Luiz Inácio Lula da Silva, and proposals for change are being discussed.[82]

The foregoing does not necessarily imply a direct correlation between competitive bidding and increased state revenues during the mining round itself, as payments based on higher mining profitability will only materialize in the extraction phase. This will be the case in Colombia. Nonetheless, based on the bidding rounds implemented by Colombia and by Brazil's SGB, the question of whether the use of competitive bidding processes for allocating mining licenses can increase state revenues can be answered in the affirmative, as the relevant legal frameworks in these countries explicitly provide for such outcomes. This indicates that competitive bidding processes can be used as an incentive for increasing state revenues, provided that the terms for allocating licenses focus on increasing nonroyalty forms of financial compensation.

As these processes become consolidated in different countries over the next few years, clearer data will become available that demonstrate an increase in revenue attributable to competitive bidding. In the meantime, the observed increases point to potential improvements, possibly linked to new regulatory opportunities for the state (e.g., the creation of areas of special interest).

This study finds no evidence of any enabling legislation for competitive bidding processes that has not been implemented in practice in the last ten years. This indicates that legal efforts are immediately put into action, preventing such rules from becoming mere gestures. In Colombia and Brazil—two of the three cases analyzed—competitive bidding is applied effectively and substantively.

Competitive bidding confers an active role on the government that it did not previously exercise due to structural constraints and weak control. In some countries, legal frameworks for the mining sector are outdated or insufficiently developed to manage more complex licenses. In others, a lack of experience has weakened the State's position vis-à-vis investors with decades of involvement in the sector, and

this makes it difficult for countries to obtain a fair return on the exploitation of their resources.

Competitive bidding allows the State to regain an active role in managing the processes before areas are allocated for exploration and exploitation. This not only empowers it but also forces it to put together the components needed to formulate a commercially attractive bid package. In taking on this responsibility, the State and its decentralized entities must consider investor perspectives while also defining realistic objectives to guide their decisions.

The present analysis shows that although the development of local content is generally mentioned as one of the expected benefits of competitive bidding, the case studies do not provide any empirical evidence to support this, probably because these processes are in the early stages of implementation. This reinforces the need to include specific indicators in future evaluations so that the public policy impact of these processes can be measured more accurately.

It is also important to recognize that it may be appropriate, in some cases, to maintain the first-come, first-served system alongside competitive bidding. Both can be useful for allocating different types of areas, especially where the transition to a new model is still being implemented. The traditional system can remain a valuable tool for investors who are prepared to take on the risk of exploring virgin areas.

Lastly, competitive bidding must be adapted to the specific characteristics of each situation, anticipating risks and leveraging its advantages in accordance with national objectives. Although each country is free to select its own approach, the academic study and practical implementation of mining auctions—particularly in LAC—has demonstrated the importance of applying the seven conditions for success set out in Section 2.3. These conditions not only strengthen institutional design but also provide greater clarity and build confidence on the part of investors, as they are aligned with practices already adopted in the region.

CHAPTER 3.
MINING RESOURCES AND ROYALTIES: AN OPPORTUNITY TO BOOST REVENUE

3.1. Introduction

The transition to more sustainable, digital societies requires that technologies be acquired, adapted, and developed. Communication technologies and low-carbon technologies require minerals such as cobalt, copper, lithium, and nickel, for which international demand is expected to grow significantly in the coming decades (9 percent per year over the next few years). Latin America and the Caribbean (LAC) plays a role in these changes due to the region's substantial reserves of the relevant metals, as well as its extraction and supply activities. This mining potential represents a significant source of additional fiscal resources for several countries in the region, such as Chile (7.5 percent of GDP), Guyana (6.4 percent), Suriname (6.2 percent), and Peru (5.6 percent). These countries have higher levels of mining revenue than others internationally (3.9 percent of GDP on average) and in the region. Argentina, Bolivia, Brazil, and Colombia also have significant mining activities, although these account for a lower share of overall revenue (i.e., less than 2 percent of GDP).

This chapter focuses on how countries, as the owners of their subsoil resources, can leverage these revenues to develop policies that promote sustainable and equitable growth. It focuses on royalties, which represent the compensation received by countries in exchange for the right to exploit mineral resources. Accordingly, it raises several considerations surrounding the design and significance of royalties for mining revenue that can be used in policy implementation. According to Galindo Paliza, Hoffmann, and Vogt-Schilb (2022), for example, these additional resources could be used to support energy transition policies, which require between US$470 million and US$1.3 billion (7–19 percent of annual regional GDP).

The following two sections provide a brief description of the most common royalty frameworks in LAC and elsewhere in the world. Section 3.4 reviews arguments in support of adjusting these frameworks to make them more progressive, using the example of lithium, a mineral required for the green transition and new information technologies. The final section includes policy recommendations drawn from these arguments.

3.2. Royalties: Definition, Types, and Calculation Methods

Mining royalties are defined as the economic (or pecuniary) compensation received by the State from private parties in exchange for the right to exploit subsoil mineral resources. Strictly speaking, they are a nontax instrument, as they represent compensation for the use of publicly owned resources[1] From a public finance perspective, however, mining royalties are treated as a tax due to the inherent characteristics of the sector (Otto et al., 2006). The rationale is that in periods of low prices or high costs (e.g., during the initial investment period), a mining project may not generate positive returns and will therefore generate low or no tax revenue (e.g., at the beginning of the project life cycle). Similarly, given that mining companies are mostly foreign-owned and the minerals are to be extracted, sold, and—in many cases—exported, rents may not remain in the country. In such cases, the associated tax revenues may be low or nonexistent, and no benefits are bestowed on the economy. It is therefore important for socioeconomic development that the State secure a share of the benefits from mineral exploitation, with particular emphasis on collecting revenue during periods of strong growth to cushion downturns. This can be achieved using royalties.

There are two types of royalties: in rem royalties and in personam royalties. In rem royalties are levied on physical or gross value measures of mineral production, such as volume or weight (unit-based royalties) or the monetary value of output at the mine mouth (ad valorem royalties). In such cases, royalties are calculated as a percentage of the relevant metric, which may be either in kind or the equivalent value in the currency selected for that purpose.[2] Certain costs, such as freight and insurance, may be deductible in the case of ad valorem royalties, depending on the applicable legislation or mining agreement. This type of royalty is the most widely used one due to the certainty of revenue flows and relative simplicity of enforcement. However, it is not neutral with respect to investor profitability, as they are payable regardless of project profitability and therefore add to the fiscal burden. They may also increase the perceived risk of mining projects, since the State's take is directly linked to production or sales rather than profits. In LAC, it is applied in Argentina, Bolivia, Colombia, and Suriname.

In personam royalties are calculated based on measures of project profitability—such as operating margins, gross profits, or the tax base of the corporate income tax. Their defining feature is the deductibility of operating costs and expenses and, in some cases, capital expenditures. This type of royalty is generally considered more neutral with respect to investors' expected profits, as the return to the State is only positive when the project is profitable. In LAC, this arrangement is used in Brazil, Chile, Guyana, Mexico, Panama, and Peru. In the cases of Chile, Panama, and Peru, however, the royalty scheme is mixed: it includes a minimum revenue floor based on

an in rem royalty, while the royalty applied above that threshold is calculated on a profit basis (in personam).

For both types of royalties, there are issues to consider in relation to investor profitability. The first is the price at which gross revenue is measured. This is generally determined and declared by the mining operator based on the terms of mineral sale/purchase contracts or sales invoices. In some cases, such as Bolivia and Colombia, the government (i.e., the mining authority) stipulates that the prices used to measure royalties will be based on published mineral prices from a reputable source.

The second issue to consider is the deductibility of royalties—specifically, whether royalty payments may be treated as deductible expenses for corporate income tax purposes. This issue is critical for maintaining an appropriate balance between the profitability expected by mining investors and the benefits accruing to society, considering the broader fiscal framework applicable to the sector. It is particularly relevant in the case of in rem or ad valorem royalties, which are payable regardless of profitability and may therefore distort production decisions, especially when operating margins are low.[3] In some countries in the region (e.g., Argentina and Peru), royalty obligations may be partially offset through legally established mechanisms that allow mining companies to finance public works of socioeconomic relevance—such as roads, hospitals, and educational infrastructure—in lieu of direct royalty payments.[4] These works are typically aligned with national development or public investment plans.

The third and final issue to consider is the progressivity of the arrangements. Progressivity refers to systems in which royalty rates vary according to the level of the underlying tax base or measured variable. If in rem royalties are applied, progressivity is typically linked to mineral prices, production level, or quality of the mineral. If the royalties are in personam, rates are instead determined by measures of project profitability, such as operating margins or gross profits. Progressive royalty structures not only enhance the equity of rent sharing—by helping to maintain a balanced distribution of returns across different levels of profitability—but also provide greater protection to investors during downturns in mineral markets, as the State's take automatically adjusts when prices or profits decline.

These issues are analyzed in greater detail in the next section, which reviews case studies from the LAC region.

3.3. Key Design Features in Latin America and the Caribbean

This section reviews the design features of royalties in Argentina, Bolivia, Brazil, Chile, Colombia, Guyana, Mexico, Panama, and Suriname. Table 3.1 details how royalties are calculated in these countries. The first category relates to the procedure for establishing royalty arrangements. In most of these cases, the design is proposed by the mining authority and then debated and formalized in legislation approved by the legislature.[5] The exceptions are Guyana, Panama, and Suriname, where royalty arrangements are formalized and implemented through mining exploitation contracts. This difference in the method of formalization is significant. When royalties are established in law, this process benefits from wider and more transparent discussions that include stakeholders who are not necessarily part of the mining sector but who are identified as potential beneficiaries of the mining revenues. In contrast, when royalties are set through contracts, agreements are between governments (as representatives of the country's interests) and investors. This may be less transparent, but it facilitates consensus on the balance between private and social benefits. The formalization of such contracts may require the approval of authorities in the legislative branch (e.g., Congress) or the judicial branch (e.g., the Supreme Court).

Table 3.1. Key Features of the Calculation of Mining Royalties

Country	Legal mechanism	Royalty base	How mineral value declared/ determined:	Progressive?
Argentina	Legislation	Value of production	Project	No
Bolivia	Legislation	Volume	Mining authority	No
Brazil	Legislation	Net profit	Project	No
Chile	Legislation	Operating margin	Project	Yes
Colombia	Legislation	Value of production	Mining authority	No
Guyana	Contract	Gross revenue	Project	No
Mexico	Legislation	Gross revenue	Project	No
Panama	Contract[a]	Operating margin	Project	Yes
Peru	Legislation	Operating margin	Project	Yes
Suriname	Contract	Value of production	Project	No

Source: Authors' elaboration based on current mining regulations.

Note: [a] Reflects the mining contract in force in 2023.

The base of calculation indicates the type of royalty involved. For most countries, the base is the value of output extracted and sold for the first time. In other words, these are ad valorem royalties in which the value is determined based on the price declared by the seller of the mineral production (fourth column). In most cases, this is the project operator. The exceptions are Bolivia and Colombia, where the value of production is calculated by the mining authority based on spot prices for the mineral.

In the cases of Chile, Panama, and Peru, royalties are based on operating margins (i.e., in personam royalties), which are generally defined as gross mining income (the difference between revenue and operating expenses) expressed as a percentage of sales revenue. Brazil is the only country in which royalties are calculated on the same base as the income tax (meaning that capital costs are considered).

Table 3.2 illustrates the State's participation in mining revenue, specifically the royalty rates levied on minerals extracted in the various countries. It shows that countries set specific rates for their main minerals, most of which are below 10 percent. In cases where royalties are defined as a percentage of operating profits, as in Chile and Peru, average rates are significantly higher than ad valorem royalties. This difference highlights not only the effect of the smaller base of calculation, but also the progressive design of these royalties, under which rates rise (and the State's share increases) as profits increase. Box 3.1 illustrates this approach using Chile's lithium royalty arrangements.

Table 3.2. Mining Royalty Rates per Country and Mineral

Country	Rates
Argentina	3% (maximum rate applicable to all minerals)
Bolivia	Gold (1–7%); silver (3–6%); zinc, lead, tin, antimony, tungsten, copper, bismuth (1–5%); iron (2–4%); tantalum, barite, and limestone (3.5%); precious stones and metals (5%); semi-precious stones (4%); indium and rhenium (5%); lithium carbonate (3%); potassium chloride (3%); byproducts and evaporite derivatives (3%); sodium chloride (2.5%); ulexite (3–5%); boron (3–5%); others (2.5%)
Brazil	Gold (1.5%); diamonds (2%); bauxite, manganese, niobium, and salt (3%); iron and coal (3.5%); stone, sand, and others (1%); precious stones (0.2%)
Chile	Rates vary according to marginal operating profits, expressed in ranges as a percentage of sales revenues (0–40%)[a]
Colombia	Coal (5–10%); nickel (12%); iron and copper (5%); gold and silver (4%); alluvial gold under concession contracts (6%); platinum (5%); salt (12%); limestone, gypsum, clays, and gravel (1%); radioactive minerals (10%); other metallic minerals (5%); other nonmetallic minerals (3%); construction materials (1%); emeralds and precious stones (1.5%); others (3%)
Guyana	Gold (5–8%); other minerals (1.5%)
Mexico	7.5% (plus a 0.5% extraordinary fee on gold, silver, and platinum)
Panama[b]	Rates vary according to marginal operating profits, expressed in ranges as a percentage of sales revenues (12–16%).[a]
Peru	Rates vary according to marginal operating profits, expressed in ranges as a percentage of sales revenues (3–20%).[a]
Suriname	• Large-scale mining: gold: 6.5% (cash payment and price > US$425), 2.25% (payment in kind) • Small and medium-scale mining: gold and silver: 2.75% • Diamonds: n/a

Source: Authors' elaboration based on current mining regulations.

Notes: [a] Copper royalty rate. [b] Reflects the mining contract in force in 2023.

Box 3.1. Chile's Lithium Royalty Arrangements

In 2016 and 2018, the Chilean government signed new contracts with Albemarle Corporation and Sociedad Química and Minera de Chile (SQM), respectively. In addition to royalty arrangements (Table 3.3), the contracts included extraction quotas, the duration of exploitation activities, contributions to research and development, value-added incentives (i.e., specialized domestic production), control and oversight measures, and contributions to communities. These elements had not been present in contractual relationships in earlier years or had only been partially developed (in the case of SQM).

Table 3.3. Lithium Royalties in Chile

Price range (US$ per metric ton)		
Lithium carbonate (Albemarle and SQM), lithium hydroxide (Albemarle)	Lithium hydroxide (SQM)	Marginal rate (%)
0–4,000	0–5,000	6.8
4,001–5,000	5,001–6,000	8.0
5,001–6,000	6,001–7,000	10.0
6,001–7,000	7,001–10,000	17.0
7,001–10,000	10,001–12,000	25.0
>10,000	>12,000	40.0

Source: Authors' elaboration based on Poveda (2020).

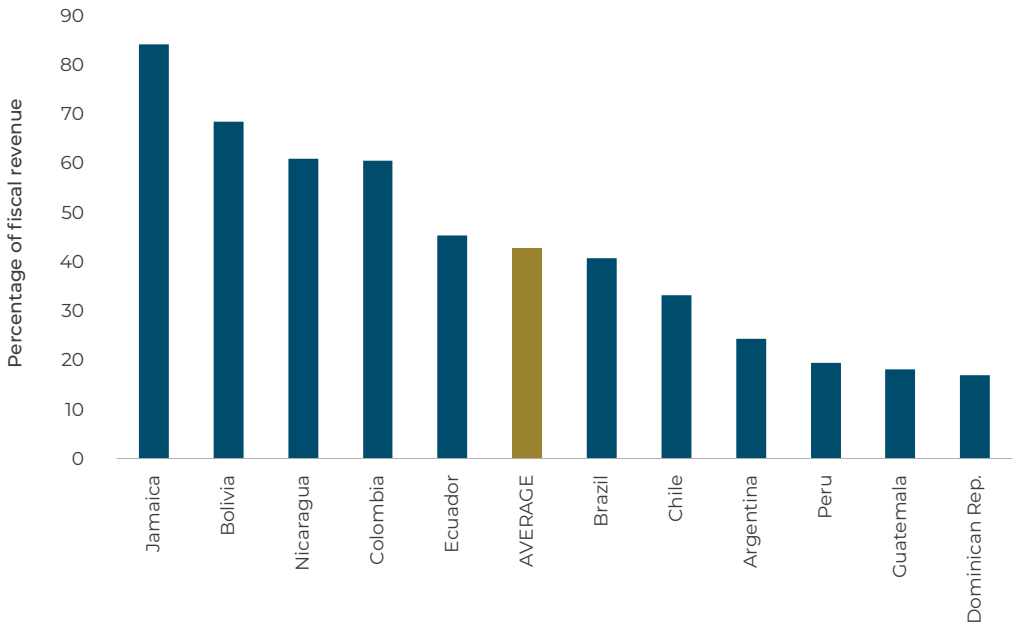
In 2023, the Chilean government announced the National Lithium Strategy, which is aimed at reviewing the strategy for exploring and mining salt flats, increasing output and value added, and improving the distribution of mining revenue between producers and the State. The strategy also provides for the creation of a strategic committee and a national lithium company, modernization of the institutional framework, and improved dialogue and citizen participation, among other things (Poveda, 2024). As a result of the strategy, the Chilean government has created a partnership with SQM for the exploitation of the Atacama salt flat until 2060.

3.4. Key Statistics on Mining Royalties

Royalties account for a significant share of the fiscal burden (i.e., tax and nontax revenue) in the mining sector. On average, they represent 43 percent of the fiscal burden, while in cases such as Jamaica and Bolivia, the proportion is above 68 percent (Figure 3.1). As indicated in the previous section, the design of royalties in the region generally involves fixed ad valorem rates levied on the value of production. In cases where the State's share is based on the operating margin, royalties are generally progressive in nature, except for Brazil. Table 3.4 provides some basic statistics on revenues from royalties.

Prima facie, countries with progressive royalty structures collect higher revenues, on average, than those with fixed rates. In terms of the stability of revenue flows, there is no apparent difference between the various arrangements, due to the varied prices of the minerals involved. Bolivia, Chile, and Jamaica stand out due to the strong demand for their minerals in recent decades: zinc, gold, and silver in Bolivia, copper and lithium in Chile, and bauxite in Jamaica. Argentina, which has substantial reserves of these minerals, collects approximately 0.01 percent of GDP on average, which suggests that its royalty arrangements should be reexamined.

Figure 3.1. Royalties as a Proportion of Mining-Related Fiscal Revenue, 1999–2022



Source: Authors' elaboration based on CEPALSTAT (n.d.).

Note: Mining-related fiscal revenue is defined as the sum of sector tax revenue plus royalties.

Table 3.4. Average Annual Royalty Revenues, 1999–2022 (in percent of GDP)

Country	Average (1)	Standard deviation (2)	Volatility (2)/(1)
Argentina	0.01	0.01	0.49
Bolivia	0.40	0.21	0.52
Brazil	0.04	0.03	0.77
Chile	0.53	0.23	0.44
Colombia	0.20	0.10	0.49
Ecuador	0.04	0.02	0.68
Dominican Rep.	0.06	0.04	0.60
Guatemala	0.01	0.02	1.25
Jamaica	0.29	0.25	0.86
Mexico	n/a	n/a	n/a
Nicaragua	0.08	0.04	0.51
Peru	0.19	0.11	0.57
Average	0.18	0.22	1.19
Fixed rates	0.15	0.18	1.20
Progressive rates	0.26	0.26	1.00

Source: Authors' elaboration based on CEPALSTAT (n.d.).

Figures for tax revenues show similar patterns (Table 3.5). Governments collect 0.35 percent of GDP on average through the various taxes imposed on the mining sector. Levels are significantly higher in countries with progressive rates (i.e., Chile and Peru). In other countries, however, revenue is no more than 0.2 percent of GDP.

Table 3.5. Tax Revenues, 1999–2022 (in percent of GDP)

Country	Average (1)	Standard deviation (2)	Volatility (2)/(1)
Argentina	0.06	0.05	0.83
Bolivia	0.26	0.25	0.96
Brazil	0.10	0.10	0.98
Chile	1.81	1.71	0.94
Colombia	0.14	0.09	0.60
Ecuador	0.04	0.04	1.12
Dominican Rep.	0.28	0.13	0.47
Guatemala	0.04	0.03	0.86
Jamaica	0.08	0.06	0.78
Mexico	0.14	0.08	0.57
Nicaragua	0.10	0.13	1.34
Peru	0.86	0.72	0.84
Average	0.35	0.77	2.21
Fixed rates	0.12	0.14	1.14
Progressive rates	0.92	1.27	1.37

Source: Authors' elaboration based on CEPALSTAT (n.d.).

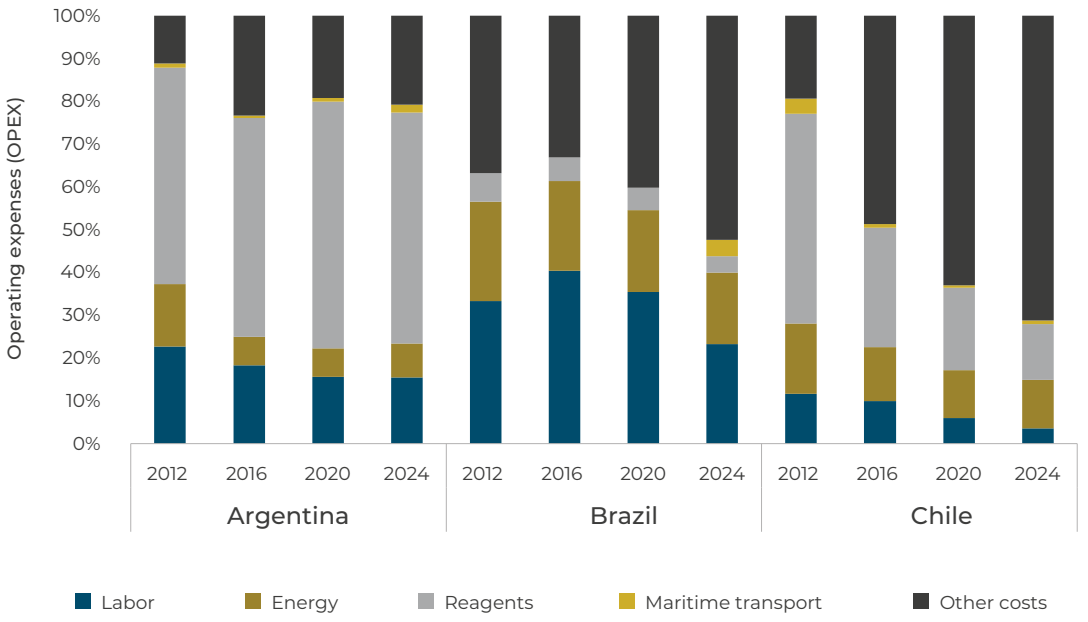
The figures above suggest that progressive rates yield higher government revenues for both royalties and taxes.[6] Although differences exist depending on factors such as the nature of the mineral deposits, the sector's maturity, and global demand for these resources, migrating to such arrangements should be considered as an economic policy measure. This issue is discussed in greater detail below.

3.5. Case Study: Lithium in Latin America and the Caribbean

Lithium is a strategic mineral required for developing new communication technologies, generating nonconventional renewable energies, and producing power storage units. The extraction, processing, and supply of lithium has expanded by approximately 25 percent per year since 2008. The mineral is sold primarily as a concentrate or as lithium carbonate or lithium hydroxide compounds. The LAC region is the second-largest producer, and a major exporter of these compounds. Production rose at a rate of 16 percent per year from 2008 to 2024, but its share declined from 56 percent to 50 as exploration and development activities in other regions expanded (e.g., East Asia). Argentina, Brazil, and Chile produce this mineral. Chile is the second-largest producer worldwide, with 68 percent of regional output (20 percent of world output), followed by Argentina (fourth largest) and Brazil (sixth largest). However, the region's potential extends beyond these countries. According to figures from the United States Geological Survey (USGS), LAC holds 52 percent of lithium reserves and resources, distributed across six countries: Argentina, with the largest reserves, followed by Chile, Bolivia, Brazil, Mexico, and Peru (USGS, 2025). Exploration activities are currently ongoing in Bolivia, Mexico, and Peru, and new developments are underway in Brazil and Argentina. Chile's industry is the most advanced one, as reflected in the size of operations in that country.

It is no surprise that the structure of production varies across these countries. There are marked differences with respect to operating costs (Figure 3.2). In Brazil, for example, worker remuneration and power costs represent more than 50 percent of operating costs, compared with less than 25 percent in Argentina and Chile. In Argentina, mining reagents (chemical substances required for extracting, separating, and purifying minerals) represent more than 50 percent of operating expenses, whereas in Brazil and Chile they are less than 6 percent and 30 percent, respectively. Overall, operating expenses have grown by 16 percent per year since 2010, which is like the rate seen in China (17.5 percent). In terms of competitiveness, lithium production projects are less costly to operate in Argentina and Brazil than in China. In contrast, operations in Chile are 1.8 times more costly, on average, than in China.

Figure 3.2. Operating Expenses

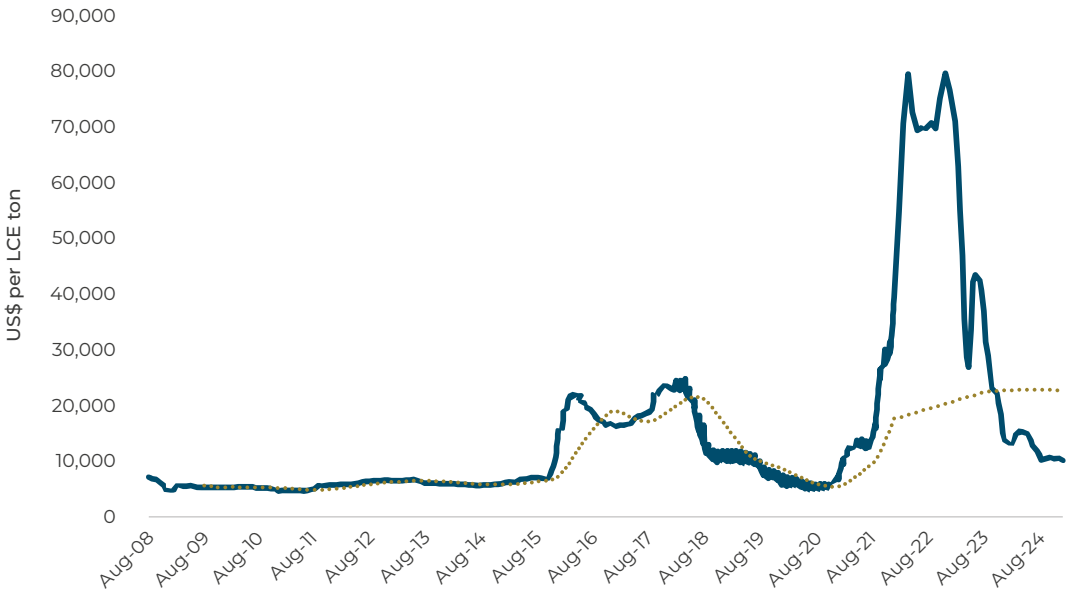


Source: Authors' calculations based on S&P Global Market Intelligence data (n.d.).

Note: Other costs encompass those relating to mineral processing and treatment, including third-party services.

At the same time, prices have risen by 34 percent on average, including two episodes of high volatility (Figure 3.3). Prices rose more than 150 percent in 2016–2017, from US$7,545 per ton of lithium carbonate equivalent in 2015 to US$19,284 in 2017 (annual averages). Thereafter, prices reached historic peaks in 2022–2023, jumping from US$5,406 in 2020 to US$71,429 in 2022. These increases have generated higher profit margins for all lithium projects worldwide since 2014 (Figure 3.4), and these rents are mostly retained by foreign investors located in North America, Asia, and Europe (Figure 3.5). This is the case for Argentina, although not for Brazil and Chile. Lithium production in Brazil was declared to be of national interest; the mineral is produced by state companies Sigma Lithium Corporation and Companhia Brasileira de Lítio. Chile has also declared lithium production to be of national interest, although it allows for private participation in the case of the Albemarle Corporation, which has a 24.4 percent ownership stake in production. The remainder is managed by Sociedad Química y Minera de Chile S.A. This distribution of ownership rights is important as it indicates that taxation design must take these specific circumstances into account if implementation is to be efficient and effective (i.e., "one size does not fit all").

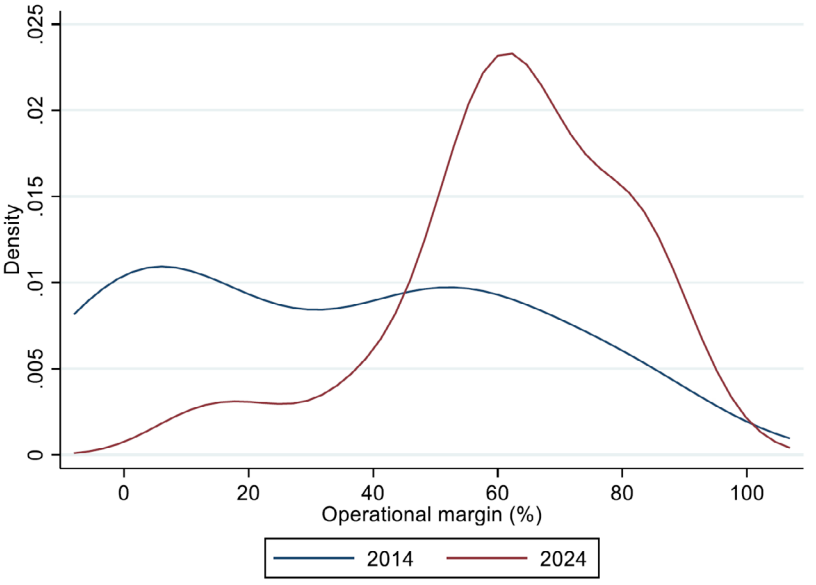
Figure 3.3. Lithium Spot Prices



Source: Authors' calculations based on S&P Global Market Intelligence data (n.d.).

Note: Spot price is for lithium carbonate.

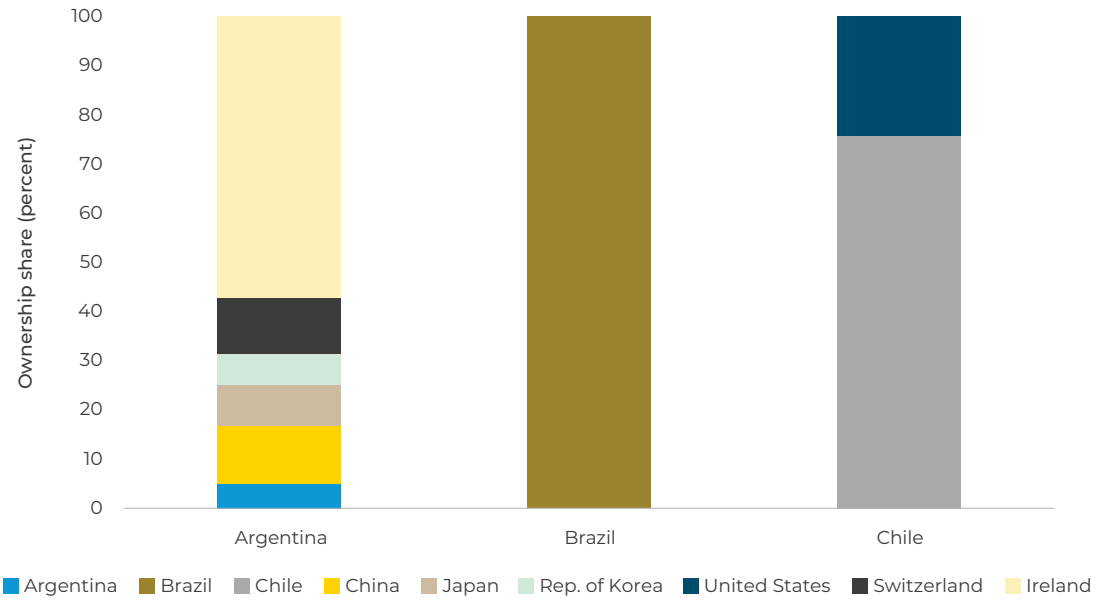
Figure 3.4. Estimated Operating Margin Distribution



Source: Authors' calculations based on S&P Global Market Intelligence data (n.d.).

Note: Operating margin is defined as the ratio of operating profits to the market value of output, expressed as a percentage of sales.

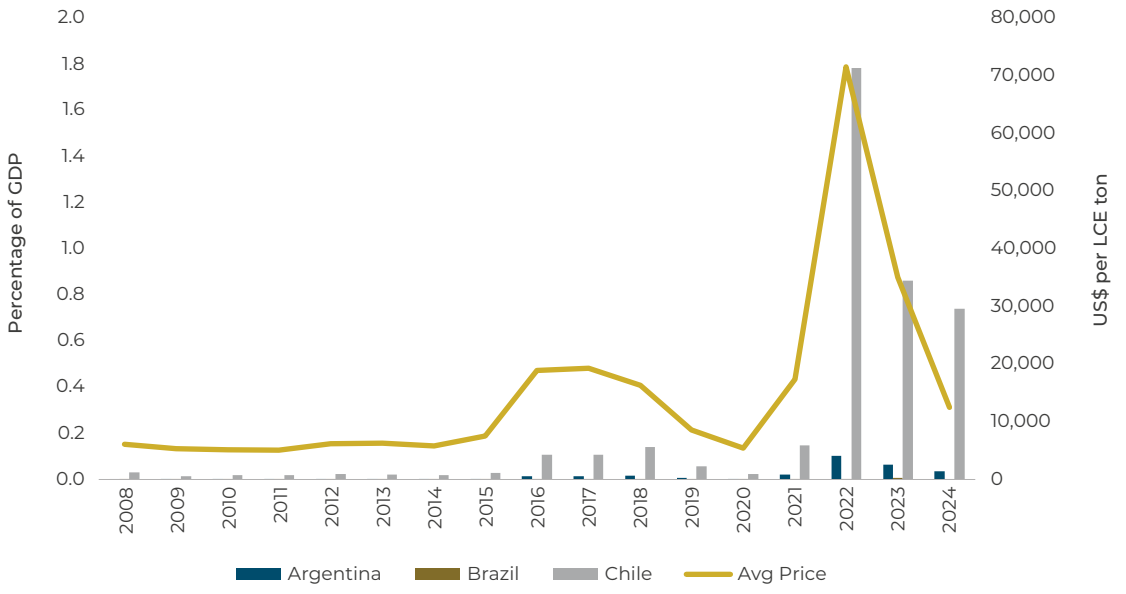
Figure 3.5. Ownership of Lithium Projects, Latin America and the Caribbean



Source: Authors' elaboration based on S&P Global Market Intelligence data (n.d.).

The estimates herein suggest that fiscal revenues in 2022 (including royalties) were as much as 1.8 percent of GDP in Chile, 0.09 percent in Argentina, and 0.002 percent in Brazil. However, these values differ significantly from the historical performance. From 2009 to 2021, tax revenues were less than 0.05 percent of GDP (or 17 percent of sales) in the case of Chile, and negligible in Argentina and Brazil (Figure 3.6). Meanwhile, the government take—made up of taxes, fees, royalties, and other monetary obligations—was 37 percent in Argentina in 2022, 35 percent in Brazil, and 56 percent in Chile (Figure 3.7).

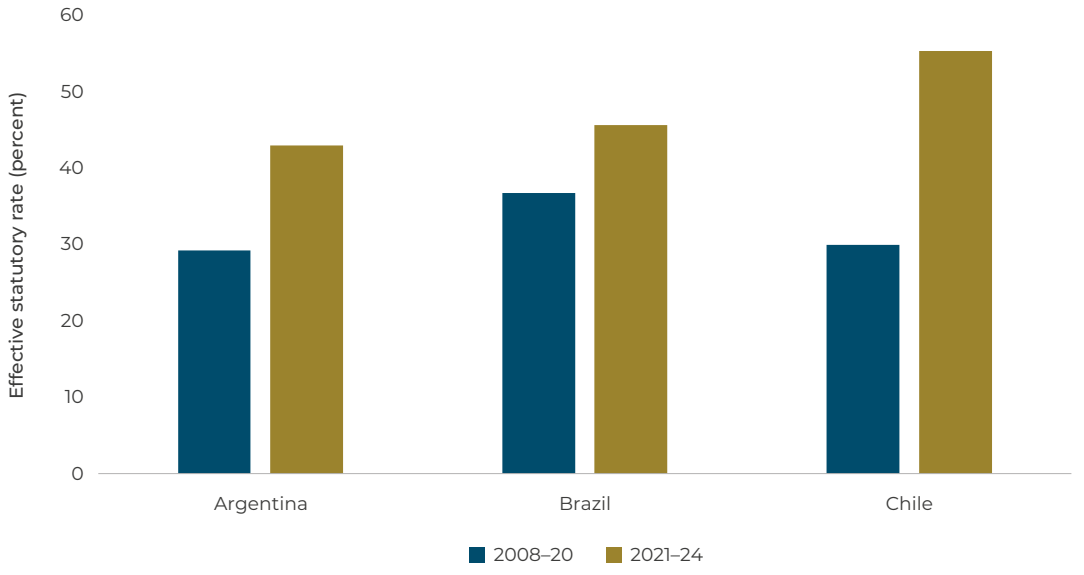
Figure 3.6. Estimated Tax Revenue from Lithium Exploitation



Source: Authors' elaboration based on S&P Global Market Intelligence data (n.d.) and current mining taxation regulations.

Note: Average spot price reflects average daily spot prices for lithium carbonate.

Figure 3.7. Effective Statutory Rate for Lithium Projects (average)



Source: Authors' elaboration based on S&P Global Market Intelligence data (n.d.) and current mining taxation regulations.

Although prices rose significantly in the 2021–2023 period, leading to windfall profits, only Chile captured a significant share of this. This was because the country applies progressive tax rates, in contrast to Argentina and Brazil.

Reyes-Tagle and Karl-Estupiñán (2025) use a dynamic stochastic general equilibrium (DSGE) model for the economies of Argentina, Brazil, and Chile to perform an in-depth analysis of the economic effects of lithium price shocks under ad valorem and in personam (i.e., on profits) royalty arrangements, with and without progressivity. Based on simulations performed using this model, the authors conclude that:

- Although fixed-rate arrangements have a positive impact on mining output, progressive schemes capture a greater proportion of windfall earnings.
- Migrating from fixed-rate frameworks to progressive, variable-rate arrangements can boost the State's share of mining revenues by a multiple of between 1.3 and 2. This represents a significant increase in royalty revenue in comparison to nonprogressive arrangements.
- Under progressive royalty arrangements, increased mining activity due to rising prices has a significant effect when compared with flat-rate structures. Progressive, profit-based arrangements yield better fiscal results.
- This is also the case for the economy, where better economic results are achieved by these types of tax structures. In the mining sector, however, the best results are obtained through fixed-rate schemes based on turnover. We therefore believe that the best arrangement is a mixed one, with a fixed, turnover-based component and a variable, profit-based one (subject to an assessment of deductible costs). A hybrid scheme can help to achieve a better balance between private interests (in the sector) and social benefits.

These results show that progressive schemes have costs that must be considered in analyses, requiring a review of current royalty arrangements and potential reforms.

3.6. Importance of Progressivity in Royalties

It is not difficult to argue that progressive arrangements are better from an efficiency/social welfare standpoint than fixed-rate ones, particularly given the volatility frequently observed in mining markets (Box 3.2).[7] First, they adjust to the profit levels experienced by investors, particularly where these are subject to business cycles (e.g., in prices for inputs and minerals). As a result, they reduce production distortions and facilitate the development of marginal projects. Second, progressive arrangements allow the tax administration to adjust its share of mining revenues in response not only to market changes but also investors' business plans and expected returns (e.g., minimum production levels and operating margins). This helps to ensure the sustainability of revenue collection over the medium and long term. In other words, progressivity allows governments to enjoy additional resources at the peaks of cycles, which then serve as a buffer when activity is depressed, and additional stimulus is required.

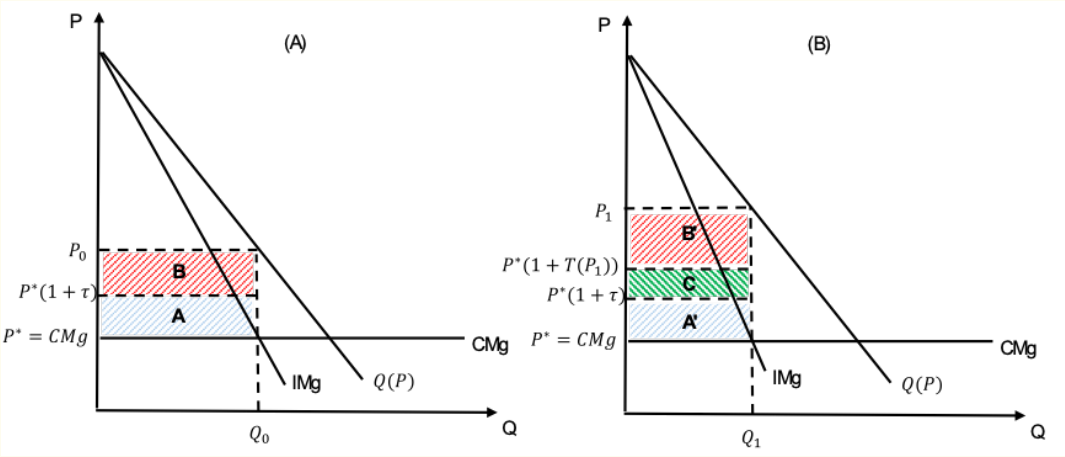
Box 3.2. Fixed versus Variable-Rate Royalties

Consider an inelastic linear demand curve Q(P) and a firm with costs C(Q) whose unit costs are constant (CMg). As in the case of other minerals, the lithium market is characterized by prices that differ from competitive prices due either to market imperfections (e.g., the presence of fixed costs or market power) or prices that are exogenously determined (i.e., firms have no influence over prices). Let P^* be the price at which the production operation is in balance and assume that royalties are ad valorem (at a fixed rate of τ). At a price of $P_0 > P^*$, the producing firm's profits are represented by area B, with area A representing the tax authority's revenues (Panel A of Figure 3.8). If the price increases to P_1, such that $Q_1 \leq P_0$, then revenue from royalties will be $A' \leq A$. In other words, revenue may decline due to demand inelasticity, as rate τ is fixed. The company's profits increase, however $B' + C \geq B$). If, instead, the royalty rate is not fixed but depends on the price level ($\tau' = T(P)$), the company receives $B' \geq B$ and the tax authority may receive $A' + C > A$, where C is the mining revenue transferred from the company to the authority. This amount will depend on the response of the royalty arrangements to price changes (e.g., bands that determine marginal rates). Accordingly, the authority should set the rate at τ' to capture higher mining revenues.

(*continued on next page*)

Box 3.2. Fixed versus Variable-Rate Royalties (*cont.*)

Figure 3.8. Revenue Distribution



One of the benefits of designing progressive arrangements is that they promote equity. More profitable projects will contribute to a larger degree, thus maintaining the balance between private and public interests. This is important from an investor standpoint, as royalty rates that depend on profitability reduce barriers to entry in high-risk, low-return activities (e.g., exploration). This leads to more sustainable development and greater competition in the sector. In addition, a variable revenue share for the State is desirable as it improves the risk distribution of after-tax losses. Since a decline in profitability is accompanied by a lower share for the government, investors expect lower after-tax losses in the recession phase of the business cycle.

Given this distribution of income and risks, implementing progressive rates creates incentives for medium-term investment planning. Progressive rates on profits lead investors to seek a stable flow of earnings so that the project faces the same average level of taxation, regardless of the stage of the business cycle. This has an impact on the level and timing of investments across the entire life of the project.

Despite their benefits, it is not easy to implement and ensure balance under progressive arrangements. The approach requires access to and constant monitoring of information on mining operation revenues, costs, and expenses, which in turn demands modern (sophisticated) administration to protect the balance between private and public benefits. However, mining authorities' knowledge of the variables is generally imperfect, and this makes it difficult to calibrate a progressive royalty structure, thus increasing the risk of profit underreporting.[8] This difficulty increases where the basis for calculation is similar to that of the corporate income tax, which also takes costs such as exploration, research, and capital expenses into

account. Poor design can therefore lead to a loss of balance, creating distortions in investment incentives and encouraging lower-quality, lower-risk projects. Similarly, if progressive rates are excessively high, this can lead to the nonimplementation of potential projects, as well as capital flight, and—in the case of weak or imperfect supervision—evasion and avoidance. These potential risks highlight the need for effective, modern administration that supports the sustained growth of efficient mining activity that contributes to a country's economic development.

Fleming, Manley, and Lassourd (2023) document the efforts made by countries across the world to introduce progressivity into their royalty regimes, as well as the challenges they have faced in calibrating them (e.g., knowledge of price trends and the frequency with which the adequacy of royalty schemes is reviewed). Once the sectoral and social policy objectives to be pursued through the royalties have been defined and disseminated, the authors propose four decision stages for their implementation.

- **Stage 1. Choosing the tax base.** Royalties may be calculated based on gross sales revenue, net sales revenue after deducting selected operating costs, or profit-based measures that incorporate a broader set of expenses, making the base like that of the mining income tax. When choosing the basis for calculation, the authorities should also consider whether to discriminate by type of mineral.
- **Stage 2. Choosing how to apply the tax rate.** This concerns how the rate affects the royalty base—in other words, whether an aggregate rate is levied on the entire base (regardless of level), or in bands (with marginal rates).
- **Stage 3. Choosing the timing of adjustments.** This relates to the frequency with which reviews of the arrangements should be undertaken. The issue is intrinsically related to the base: if progressivity is based on prices, the frequency needs to be higher to maintain the balance between private interests and social benefits. If, in contrast, rates are profit-based, the frequency is lower as it does not depend on market values but rather on the sector's competitiveness. In either case, the authorities will need to access sales prices and costs, verify this information, and determine profit indicators (e.g., earnings before interest and taxes).
- **Stage 4. Calibrating parameters for the royalties.** Once the decisions have been taken, the royalty arrangements for the sector must be prepared and formalized. When choosing the base and determining how the royalty rate will affect it, bands/brackets must be established, as well as the applicable rates. Burkina Faso, for example, uses three bands and a price-based tax base, while Peru uses 17 bands based on operating margins. On this point, the authors recommend that "governments should design variable royalties with very progressive bands to capture a share of potential price windfalls but with a

ceiling at a reasonable rate because eventually, costs tend to follow prices" (Fleming, Manley, and Lassourd, 2023, p. 130).

Implementing these stages requires a modern mining administration, and the challenge in this respect lies not only in acquiring qualified human capital, but also in using information systems that facilitate effective data capture and verification. It also requires legislation that contains clear and transparent rules regarding the administration's objectives for the sector and its roles, as well as the appropriate incentives for stimulating the sector's production efficiency.

3.7. Policy Recommendations

Reviewing the incidence of the tax burden—and royalties in particular—is important for safeguarding the competitiveness of mining activity, promoting and protecting investment, and generating additional resources that help finance new technologies and public policies that address social and environmental needs and promote sustainable and inclusive economic growth. Accordingly, there is a pressing need to reassess the incentives created by the current design of mining royalties.

This chapter uses revenue data and the lithium case study to demonstrate the importance of altering royalty schemes to include progressivity as a feature. Progressivity helps to preserve not only the financial sufficiency of projects, but also the balance between the benefits to the investor and those that accrue to the State. Progressive royalty schemes can also incorporate equitable arrangements, with windfall profits contributing more (and the opposite occurring in times of recession). In this sense, royalty arrangements based on project profits (with objectives and design features like an income tax) support adequate returns for investors and fair compensation for the exploitation of mineral resources, thus improving efficiency and well-being in the region's countries.

The mining tax policy revisions that this chapter has sought to encourage will help to reduce distortions by modulating incentives to enhance tax effectiveness. However, more complex design must be accompanied not only by a strengthening of institutions and their information and control systems, but also by the creation of partnerships to facilitate and improve the exchange of information on both companies and markets. These actions should also seek to strengthen sectoral policy with the aim of balancing incentives in the sector, leading to greater efficiency, improved competitiveness, and increased revenue collection. This, in turn, will allow governments to finance investments that drive technological innovation and economic growth.

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ANNEX 1. QUALITATIVE SCORING METHOD

To assess the tax incentive arrangements reviewed for the selected countries in Chapter 2, the revenue risk categorization provided by IGF and OECD (2018a) should first be considered, with weights assigned as per Table A1.1.

Table A1.1. Risk Categories

Risk category	Weight
Medium	1
Medium-high	2
High	3

Thereafter, these weights should be assigned to the types of tax incentives listed in Table 1.6, as shown in Table A1.2.

Table A1.2. Types of Tax Incentives and Associated Behavioral Responses

Tax incentive	Risk	Weight
Tax holidays	High	3
Fiscal stabilization agreements	High	3
Exemptions from withholding taxes on interest and services	Medium-high	2
Cost-based incentives	Medium	1
Import duty exemptions	Medium	1
VAT exemptions	Medium	1

Last, these risk categories and weights should be applied to the list of tax incentives in each country. The overall revenue risk is the average of the weighted list, rounded to the nearest unit.

ENDNOTES

Introduction

1 This agency collects, monitors, analyzes, and generates scientific knowledge relating to natural resource conditions, problems, and challenges. It describes itself as a mapping agency. For additional information, see https://www.usgs.gov/.

2 Based on interviews carried out for Section 4 of Chapter 1 on competitive bidding. Interviews were conducted in Brazil (with an attorney from William Freire Advogados Associados, specializing in bidding processes) and Colombia (with the investment promotion manager for the National Mining Agency). This section highlights the fact that the mining agencies in both these countries were created only recently and have taken on the role of managing the licensing process.

3 In the case of Suriname, an agreement was developed with the Alcoa corporation to develop a bauxite, aluminum, and alumina mining operation. This favored the political interests of the Netherlands but failed to provide clarity in terms of company's commitments to share returns with the country. The linkages of dependence formed between the entity and the economy of the region where it was established made it almost impossible to revise the original agreement. The agreement ended in 2015 when the company withdrew voluntarily from mining project.

4 This alternative method is used in at least five countries in the region and is also known as a competitive bidding process, competitive allocation mechanism, licensing competition, or auction (Gutiérrez and Sucre, 2022).

1. Mining Tax Incentives in Latin America and the Caribbean: An Evaluation of Four Countries

1 The content of this chapter was prepared for the Conference on the Future of Resource Taxation in Latin America and the Caribbean, held September 30–October 2, 2024, in Lima, Peru.

2 The IMF (2012) provides a description of the conflicts between public and private interests, which are reflected in mining taxation regimes. See this study for further detail.

3 Benefits are also offered to traditional and artisanal mining activities, which are not addressed in this publication. For further information, see IGF (2017).

4 Tax expenditures are resources forgone by the State due to the existence of benefits and incentives that reduce the tax burden of certain taxpayers (CIAT, 2011). As such, the tax incentives examined here are tax expenditures.

5 Resources and reserves generate a potential benefit (i.e., they are considered assets for accounting purposes), with valuations based on expected prices at the time the minerals are extracted and sold. However, these valuations do not generate social benefits unless they involve a fiscal policy that provides for their sale at some point in time. In the interests of simplicity, such considerations are not examined in this chapter.

6 According to Daniel and Sunley (2010), fiscal stability refers to the set of conditions that ensure stability and predictability in fiscal rules (particularly those relating to taxes and contributions), as well as in production-sharing, pricing, or state participation rules, all of which govern the division of income from a natural resource project. Tax stability agreements—i.e., those focused on maintaining tax conditions—are the most common and frequently used type of agreement.

7 According to Lent (1967), fiscal stability for large enterprises can undermine revenue structures and limit governments' ability to raise revenue from dynamic sectors. This hinders the objective of adjusting tax pressure in growing economies and forces governments to increase tax rates for those not benefiting from stability clauses (i.e., tax inequity).

8 According to economic theory, these types of incentives encourage investor self-selection based on costs, which cannot be observed by the tax authorities. Such self-selection reduces information asymmetries between investors and the authorities. See Laffont and Martimort (2009) for further information.

9 The Navoi region in Uzbekistan and the Platinum Valley in South Africa are two examples of special economic zones for mining activities.

10 This law was regulated by Presidential Decree 749/2024.

11 Minimum investments are US$600 million for oil and gas activities and US$300 million for offshore transportation and storage.

12 The exemption applies to equipment for the following mining activities: sorting, screening, separating, washing, crushing, grinding, mixing, or kneading earth, stone, ores, or other mineral substances; rock drilling or earth boring tools; furnaces and ovens for roasting, melting, or heat treatment of ores, pyrites, or metals (Dentons, 2022).

13 Projects of a developmental and risk-bearing nature that are essential for development in Guyana (In-Aid of Industry Act, Chapter 81.02).

14 Under the tax treaties signed by Guyana, taxpayers are entitled to double-taxation relief on their foreign-source income. Unilateral relief is also available for taxes paid in non-treaty countries. In the case of British Commonwealth countries, the relief from tax in Guyana is 50 percent of the relief that would be available if the foreign country were a treaty country. For other countries, the relief is 25 percent. In all cases, the available relief is limited to the tax owed in Guyana on relevant income (Orbitax, n.d.).

15 IGF (2019) reviews contractual information from 21 countries, as follows: Afghanistan, Burkina Faso, Burundi, Cameroon, Colombia, Ecuador, the Philippines, Guinea, Liberia, Madagascar, Malawi, Mali, Mozambique, Mongolia, Niger, Peru, Democratic Republic of the Congo, Senegal, Sierra Leone, Tunisia, and Zambia.

16 As previously indicated, the purpose of these agreements or clauses is to guarantee investors a stable institutional framework and stable fiscal obligations over a defined period. In the presence of tax incentives, however, this stability is guaranteed over a time period that exceeds the financial rationale for a project.

17 Agreements are published on the website of the Guyanese Ministry of Finance that expressly refer to a full exemption from tax obligations, except for the fuel tax and royalties. See https://finance.gov.gy/mining/.

18 This section draws largely on Mintz, Bazel, and Reyes-Tagle (2023) to provide a complementary evaluation of tax incentives in the LAC region. See the Mintz, Bazel, and Reyes-Tagle publication for further detail and discussion.

19 These different effects can also depend on specific fiscal regimes for minerals (e.g., royalty rates), which offer differentiated incentives to companies and investors (see Section 1.4).

20 The fiscal summary provided for Guyana includes this most recently approved rate.

21 While Argentina, Mexico, and Peru have regimes or rules for transfer prices, Guyana's mandate extends only to transactions.

22 See OECD (2024) for details of progress under Action 6 of the Inclusive Framework on BEPS.

2. Can Competitive Bidding Increase Mining? The Cases of Brazil, Colombia, and Suriname

1 The "traditional process" refers to the method commonly used to allocate mining licenses in the sector. This process is named after the legal principle that governs it ("first-come, first-served"), based on which the authorities, when deciding on the allocation of a license, give priority to the investor who submitted the first application. This method dispenses with the possibility that investors will compete for the license.

2 Competitive bidding processes are primarily used in the oil sector, where seismic surveys provide more detailed information on the economic potential of resources than geological surveys in the mining sector (Haddow, 2014). Mining companies therefore require more detailed information in order to make investment decisions.

3 The Natural Resource Governance Institute (NRGI) defines local content as the value that an extraction project brings to the local, regional, or national economy beyond the resource revenues generated. It refers to all of the efforts made by a country to improve the local economy by leveraging an extractive project as a whole. For example, the local content of a project might mean that a mining company hires local labor and procures local goods and services from the host country. It also involves leveraging activities that are crosscutting or concurrent with mining operations, as these yield indirect benefits due to the existence of the project (NRGI, 2015).

4 This publication does not address government procurement in the strict sense, but rather the specific sector mechanisms for assigning mining rights.

5 Each competitive bidding process is unique and adapted to the legal and regulatory framework of the country implementing it. This means that the State uses the content of the tender documents to protect its interests, consistent with existing regulations, in order to ensure that bidder selection is transparent and legal. Section 2.4, for example, shows how the winning bid is selected in Colombia based on a scoring system that assesses the economic and technical components of each investor's bid, as well as the commitments made.

6 In her study of the application of game theory to the Peruvian economy, Saavedra Ríos explains that there are cooperative and noncooperative games. She proposes competitive bidding as an example of a noncooperative game as it is a process in which multiple bidders seek to maximize their own benefit under conditions that are applied to all (Saavedra Ríos, 2016).

7 The development of the indicated categories can be found in Chapter 13 of Readhead et al. (2023).

8 Some countries have viewed competitive bidding as a way of increasing investment and reducing their dependence on hydrocarbon extraction. Saudi Arabia is one such case; this country offered three mining licenses in 2022 in the expectation that investors would be interested in zinc and copper exploration and extraction. See El Yaakoubi (2022) for further information.

9 Peter Cramton acknowledges this type of benefit in general terms in his publication *How best to auction natural resources*, where he indicates that "The advantage of an auction is that it is a competitive and transparent method of assignment, which if well designed, can maximize revenues for the developing country" (Cramton, 2010).

10 Environmental costs and community management expenses usually diminish the investor's ability to pay once activity has begun. Although they do not represent any direct increase to government revenue, these expenses lead to a reduction in the expected return as they require a reassessment of the agreed return. When competitive bidding is used, minimum requirements or good practices can be included in the tender documents that influence the scores in the components used to select the final winner.

11 The publication highlights the lack of transparency in beneficial ownership, while the failure to verify whether government officials are involved in participating companies weakens the integrity of the award process, thus facilitating corrupt practices. See Westenberg and Sayne (2018) for further information.

12 The Aynak (copper) and Hajigak (iron) auctions in Afghanistan are examples of competitive bidding processes for the mining sector that failed due to political instability, institutional weaknesses, social and environmental problems, and prolonged delays in meeting contractual commitments. For further information, see World Bank (2012), Global Witness (2012), and Arezou (2020).

13 International studies on the topic of competitive bidding include one prepared by the Columbia Center on Sustainable Investment, which identified Brazil as one of the countries for which more information was required. To prepare this chapter, and based on the information presented in the aforementioned study (Columbia Center on Sustainable Investment, 2019), an additional review was undertaken of current regulations governing competitive bidding in Brazil. This revealed that the country has made surprising progress in this field.

14 These administrative fees are known as emoluments, and include payments for the transfer of mining rights, annual import-related fees, and permit registration costs. The process for accessing the electronic platform for participating in an auction is described in the summary published by Brazil's National Mining Agency (ANM-Brazil, 2022), which sets out the results of these processes as follows: "Public notices are published in the Official Gazette of the Union (DOU) and on the SOPLE website for each round, and users can express interest in one or more of the areas offered, within 60 days of start date for the prior public offering. As provided for in Section 1 of Article 46 of Decree 9,406 of 2018, the identity of the participants remains confidential and is even inaccessible to officials of ANM, the Availability Notice Commission (CED), and other participants. This prohibition lasts from the start of the prior public offer until the deadline for registering financial proposals for the electronic auction. In the event that only one expression of interest is submitted for a given area, no electronic auction is required. The participant must submit their application for a mining title by paying the respective fees within approximately 30 days of the date of publication of the approved result in the DOU. In this cases, the area is said to have been awarded at the public offer stage" (ANM-Brazil, 2022, p. 21).

15 The SGB was converted from a private entity into a public one in 1994. For a summary of its history, see https://www.sgb.gov.br/trajetoria.

16 "CPRM holds approximately 330 mining concessions, divided into 29 blocks. Five of these qualified under the Investment Partnership Program (PPI), and the first mining right sold was for Palmeirópolis. It is estimated that these two assets could generate around R$300 million in investments and annual tax revenue of R$6.5 million during the useful life of the enterprise, in addition to creating 400 direct jobs and 4,000 indirect ones in the vicinity of the projects" (Ministry of Mines and Energy, 2020).

17 The process description includes the following statement: Award criterion – Proposed royalty percentage. General information on the process can be found at https://www.mme.gov.br/energiaemineracaoprobrasil/leilao-palmeiropolis-to-area-da-cprm. The CPRM website also describes auction 0001/2019 for the Palmeirópolis polymetallic complex as a type of "ascending auction: Bid with the highest royalty percentage." For more information, see https://www.sgb.gov.br/leilao-palmeiropolis-go-zinco-cobre-niquel.

18 The areas that qualified for the Investment Partnership Program involve five mining projects, including the following: copper (Bom Jardim); phosphates (Miriri); zinc, lead, gold, coal (Carvao Candiota), and kaolin (Caulim do Rio Capim). The first project to be allocated was the Palmeirópolis polymetallic project (zinc, copper, lead, and gold), which was awarded to Perth Recursos Minerais (Source: https://www.mme.gov.br/energiaemineracaoprobrasil/leilao-palmeiropolis-to-area-da-cprm).

19 According to information published by ANM-Colombia on its website on the occasion of its participation in the International Convention of the Prospectors and Developers Association of Canada (PDAC), "in 2021, ANM designed the first competitive selection process for copper, which led to the declaration of six strategic mining areas with high copper mineral potential in the Caribbean region (four in Cesar and two in La Guajira). Contracts have already been awarded for five of these. The first—Block 4, La Guajira—was awarded in 2021. The second mining round was launched in the same year, for phosphates, followed by the third round in April 2022 (for coal) and the fourth round in June 2022 (for gold)" (Ministry of Energy, 2022).

20 The second of these entities is responsible for setting the base price for mining royalties.

21 In a demonstration of the country's interest in change, the mining code was updated in 2017 and, according to an interview with the manager of the Presidential Commission for Development in Suriname, the authorities anticipate a further update in the near future.

22 "With regard to the *competitive bidding processes* that are organized by ANM (and are thus unrelated to CPRM auctions or the PPI), the rules established in the Mining Code Regulations are of a general nature only, dividing the process into two stages: a public call for bids and the electronic auction. The latter occurs where more than one person expresses interest in a given area" (de Mattos Silva, 2019).

23 Although information was available on more than 1,300 areas, the decision was taken to offer only 500 in the first bidding round launched by ANM-Brazil. This decision reflected a cautious institutional approach to the initial use of the new electronic system, as well as the desire to avoid excessive competition in a process that was still at the testing stage. The selected areas were of low attractiveness, and those exhibiting conflicts with protected territories, indigenous areas, military uses, and minimum required dimensions were excluded. These decisions were explained publicly in the following technical note: https://www.gov.br/anm/pt-br/acesso-a-informacao/participacao-social/consultas-publicas/consulta-publica-n-02-2020/nota_tecnica_do_edital_de_disponibilidade_01.

24 See https://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2017/Mpv/mpv791.htm. This was subsequently passed into law through Law 13, 575 of December 26th, 2017: https://www.planalto.gov.br/ccivil_03/_Ato2015-2018/2017/Lei/L13575.htm. ANM-Brazil's mandate was formalized through Decree 9,587 of November 27, 2018: https://www.planalto.gov.br/ccivil_03/_ato2015-2018/2018/decreto/D9587.htm.

25 Under the administrative regime, mining rights are granted by public authorities in the exercise of their public powers. This model, which is dominant in several LAC countries (e.g., Argentina, Bolivia, Brazil, Ecuador, Mexico, and Peru), has been criticized for its excessive flexibility, which could give rise to discretionary decisions by the mining authority (Witker Velásquez, 2021, p. 106). Under Article 2 of Decree 9,587 of 2018, ANM-Brazil's functions include issuing regulations governing the administrative procedures for granting mining titles; supervising extractive activities; and regularly (at least once per year) compiling and disseminating the geological and mining information reported by mining rights holders.

26 "The procedure for available areas (competitive bidding) is led by ANM-Brazil and is aimed at selecting parties who are interested in continuing existing mining projects that had previously been awarded to third parties but which returned to the ANM portfolio for various reasons (e.g., rejection of an application, expiration of the title, abandonment of the deposit or mine, withdrawal, or relinquishment of mining rights). Until 2018, interested parties were selected based on the quality of their technical proposals. However, a new selection method was introduced through Decree 9,406 of June 12, 2018, for which regulations were subsequently issued through Resolution 24 of the ANM Collegiate Board, dated February 3, 2020" (https://www.gov.br/anm/pt-br/assuntos/disponibilidade-de-areas).

27 Interview with a private sector attorney specializing in bidding processes (William Freire Advogados Associados law firm).

28 The last modification under this first round occurred on May 7, 2021. For further information, see https://www.gov.br/anm/pt-br/acesso-a-informacao/disponibilidade-de-areas/rodadas/colecao-concluidas.

29 The SGB was previously a private company—Companhia de Pesquisa de Recursos Minerais (Mineral Resources Research Company, or CPRM)—but this became a state-owned company in 1994, allowing it to hold State land for mining exploration and exploitation. More information on the SGB's history can be found at https://www.sgb.gov.br/trajetoria.

30 "These areas are part of the asset portfolio of CPRM, a state-owned company that performs the functions of the Brazilian Geological Survey and is attached to the Ministry of Mines and Energy. The mining rights are the result of research carried out by the institution in the 1970s and 1980s" (Ministry of Mines and Energy, 2020).

31 "Marcio Remédio, Director of Geology and Mineral Resources at the Brazilian Geological Survey (CPRM), says that the initiative allows the SGB to fulfill its mission of helping to improve the quality of life and sustainable development in the country. 'I believe that the mining sector is an important part of regional development. These assets have not generated benefits for society for more than 30 years. This partnership with the private sector, with the support of the PPI, is definitely a tool for the country's development,' stated the Director" (Ministry of Mines and Energy, 2020).

32 "Although the terms *mining royalties* and *CFEM* are generally used interchangeably, CFEM is the specific name used in Brazil for financial compensation paid in return for the exploitation of mineral resources. Royalties, in a broader sense, may include other forms of compensation that do not directly apply to the Brazilian legislation governing the CFEM" (Coelho Gonçalves, 2024).

33 The draft resolution proposed by ANM-Brazil provides for mandatory advance payments upon completion of the process, separate from the traditional royalty regime. It also introduces two financial guarantee mechanisms—one at the time of submitting the bid and another once the winning proposal has been selected—to ensure that the commitments made by bidders are fulfilled and public revenue protected in the event of withdrawal. In addition to the initial payment, the bidding scheme ensures a guaranteed minimum return by requiring minimum investment in exploration activities. In the event that this obligation is not met, the winning bidder must compensate the State (specifically the CPRM) for the drilling works not carried out, as provided for in the draft preliminary contract included in the tender notice (de Mattos Silva, 2019).

34 The regulatory results evaluation (ARR) prepared by ANM-Brazil documents the initial effects and management performance of the competitive bidding system that has been in place since 2020. The report analyzes the regulatory impacts resulting from implementation of the mechanism between 2020 and 2022 and includes data on institutional performance and the results obtained in the first rounds. It can be found at https://sei.anm.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?iPKNOI4i-Tt3bdeqzGJgGCgYH-B6kWAvCl8aH0kRl60KApLZ8ijCcbaTgZfY9aX0N_4Ctr4Mvaxc04FuiMC2f9RggrC4VZhowIxnQcXX2KAmChHNgOwpvVlHZCgeAyCe.

35 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

36 "ARTICLE 20. Reserve areas for mining development. The following areas shall be classified as reserve areas for mining development: Strategic Mining Reserve Areas: The National Mining Authority shall identify minerals of strategic interest to the country, in respect of which it may indefinitely delimit special areas, where such areas are free, based on the available geoscientific information" (Law 1,753).

37 "The mining potential of these areas shall be assessed, to which end geological mining studies shall be carried out by the Colombian Geological Service and/or third parties contracted by the National Mining Authority. Based on this evaluation, the Authority shall select the areas with high mining potential" (Law 1,753).

38 "These areas shall be granted through a competitive selection process. In the terms of reference for this process, the National Mining Authority shall establish minimum participation requirements, evaluation criteria, and special obligations on the part of the concessionaire, and may also establish minimum financial contributions paid in addition to royalties. No new proposals shall be accepted for these areas, nor shall any mining concession contracts be signed. The Mining Authority shall be supported in this endeavor by the Ministry of Environment and Sustainable Development (Law 1,753).

39 "In the event that the areas assessed are not selected, the National Mining Authority shall terminate the delimitation process, in which case the areas shall be classified as free for the award of concessions under the ordinary regime of the Mining Code" (Law 1,753). Note the similarity with the case of Brazil, where free areas for which geological information is unavailable are excluded from the competitive regime and are therefore offered under the first-come, first-served model.

40 "In the absence of any bid participants or offerors for a given area, the National Mining Authority may retain this area for tender in a future selection process, without prejudice to the ability to withdraw it at any time" (Law 1,753).

41 The final paragraph of Article 20 of Law, 1753 states that "The national government shall issue regulations governing the matters addressed in the preceding paragraphs. In the Special Exploration and Exploitation Contracts arising from these delimitations, special rules and obligations may be established that are additional or different to those established in the Mining Code." The legislation may be found at https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=61933.

42 Article 4.1 (p. 33) of Resolution 150, 2021, sets out the general provisions regarding the additional compensation, indicating that "The successful bidder agrees to pay quarterly to ANM an additional compensation tantamount to a share of the value of the production at the mineshaft calculated on the total volume produced within the awarded AEM. This additional compensation will be settled considering the base price for settlement of royalties set by the UPME in accordance with the resolution in force for the quarter wherein it was caused." The legislation may be found at https://www.anm.gov.co/sites/default/files/resolucion-150-del-18-marzo-2021.pdf.

43 The formula for calculating the additional payment (AP) is as follows: AP = X * Po *PA, where X represents the total amount of mineral produced, Po represents the price basis for settlement of royalties set by UPME, and PA corresponds to the share (percentage) offered by the bidder or counterbidder with their bid or counterbid. Both the quantity of mineral produced (X) and the base price (Po) will be calculated in a manner similar to the corresponding royalty for each mineral produced in the AEM. The participation percentage (PA) is the percentage offered by each bidder or counterbidder with their respective bid or counterbid. A format is provided for this purpose in Annex 7 of ANM-Colombia Resolution 150 of 2021.

44 "...offer the same additional compensation, but one counteroffer has a higher score for the Additional Exploratory Program, then preference will be given to the counteroffer with the highest score for the Additional Exploratory Program. Accordingly, a tie with respect to the additional compensation will not be further analyzed if any counteroffer has a higher score for the additional exploratory program. (iii) ...offer the same score for the Additional Exploratory Program and the additional compensation, the tie-breaking criterion for such counteroffers shall be the one that has filed the counteroffer first in time, in accordance with the date and time of filing recorded by AnnA Minería for such purposes" (ANM-Colombia Resolution 150 of 2021, pp. 27–28).

45 A fee is payable for access to the data room offered by the Colombian Geological Survey, expressed in dollars: "Payment of the service is an essential requirement to request authorization of the User of the Participants and of the interested parties and access codes to the Data Room. Access to the Data Room has a cost of US$923.44 dollars of the United States of America per 8-hour session. This value includes VAT. The aforesaid amount is NOT refundable under any circumstances; therefore, one the payment is completed to request access—whether it be individually or collectively—no refunds will be made for the amount paid for access to the Data Room" (information accessed at https://mineriaencolombia.anm.gov.co/sites/default/files/docupromocion/Data-Room-Access-guide.pdf).

46 These include the notice of call for expressions, together with the terms of reference and annexes (ANM-Colombia Resolution 150 of 2021, pp. 10–11).

47 This consists of an in-person auction for which official records are kept. An example of this was the auction for the Palmeirópolis project, where no ascending bidding occurred as no other bidder was present in the room. See https://www.sgb.gov.br/documents/d/guest/ata_sessao_publica-pdf.

48 In Colombia, other bidders have an opportunity to improve their offers. This is defined as "the opportunity for the initial offerer to improve their bid only once and for a determined period with respect to the most favorable counteroffer for the same AEM" (ANM-Colombia Resolution 150 of 2021, p. 11).

49 "Opportunity to submit improved offer - 15 business days after the publication of the assessment report of the counteroffers" (ANM-Colombia Resolution 150 of 2021, p. 16). The best offer is considered an "opportunity for improvement" as it allows for the chance that the initial offerer has to improve their bid only once and for a determined period with respect to the most favorable counteroffer for the same AEM" (ANM-Colombia Resolution 150 of 2021, p. 11).

50 A 2017 study of this topic by Cameron and Stanley identified the need for an agency responsible for managing geological data as a facilitating principle for the management of mining license allocations: "In designing and/or conducting a licensing round, several government authorities are likely to be involved, with one designated as the lead authority. It will face a number of constraints, both external and internal. Geology and price expectations, each critical to investor interest, tend to fall into the first category; there is not a great deal that the authorities can do about them. Some actions are possible, however. If uncertainty about geology is a factor, a government can prepare comprehensive information packages based on existing data and the possible acquisition of limited new data along with their interpretation. Good practice encourages this" (Cameron and Stanley, 2017, p. 90).

51 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

52 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

53 Interview with the Manager of the Presidential Commission for Development in Suriname.

54 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

55 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

56 "The notice for the seventh round was published on December 15, 2022, offering 4,647 areas for auction. Due to procedural and operational difficulties, however, the round was ultimately canceled consistent with the provisions of SEI Technical Note 1716/2023-DIAED/SOD-ANM/DIRC and Decision 6530084/GAB-DG/ANM/2023 (William Freire Advogados Associados, n.d.).

57 According to the interviewee, this Vice Presidency has developed bidding documents for auctions relating to the exploration and exploitation of a particular product, as well as rounds to formalize related work in areas of special interest regulated under Law 1,753 of 2015 (National Development Plan 2014–2018).

58 Interview with the Manager of the Presidential Commission for Development in Suriname.

59 Article 7 of this code states that "mines are the private property of the nation or the provinces, depending on the territory in which they are located." Article 346 delegates to the provinces the power to carry out geological studies and develop competitive bidding processes for allocating mining exploration licenses in areas of special interest.

60 Alberto Castillo has participated in several intergovernmental forums to promote and discuss the regulatory changes that the province has made in order to fulfill the Salta development and growth project. This project is known as the 2030 Provincial Plan for Sustainable Mining Development. For further information, see https://www.salta.gob.ar/prensa/noticias/ponen-en-valor-la-importancia-estrategica-de-salta-en-el-desarrollo-minero-argentino-91405; https://saltamining.com/contenido/2166/alberto-castillo-en-los-proximos-tres-anos-salta-va-a-ser-el-principal-productor; https://www.instagram.com/noticiasdemineria/p/C8zDPCixbCJ/.

61 For each area offered, ANM-Brazil makes the technical data sheets available through the SOPLE portal. Any interested party may request access to the mining procedures for these areas by submitting a request through the ANM-Brazil digital protocol, addressed to the corresponding regional unit and providing an email address for the response (William Freire Advogados Associados, n.d.).

62 The modernization of the auction system through a partnership between ANM-Brazil and the Brazilian stock exchange (B3) highlights the need to invest in administrative and technological infrastructure that ensures transparency and security in data management. This initiative builds on the development of platforms such as SOPLE, which allows the electronic management of bidding rounds. For additional information, see https://www.gov.br/anm/pt-br/assuntos/noticias/parceria-entre-anm-e-b3-moderniza-leiloes-de-areas-para-mineracao-no-brasil.

63 Video recordings of ANM-Brazil's public hearings can be viewed on its YouTube channel: https://www.youtube.com/watch?v=GNWFDrBtano&list=PLoP8nQ7f1EABYWmqn0YP0mTg9jtUXNP8L.

64 Other countries, such as India, have incorporated competitive bidding processes into the allocation of mining licenses, using electronic tools that improve the monitoring and participation of all types of investors by means of a web platform. Jain explains the changes introduced by this country in 2015 as follows: "The Indian mining reform (IMR) adopted by the government in 2015 reflects a paradigm shift from a first-come, first-served basis resource development model anchored on extractivism (Extractivism generally refers to an economic model centred on the large-scale removal (or 'extraction') of natural resources for the purposes of exporting raw materials) to one in which mineral resources are harnessed through e-auction and which would enable to accelerate broad-based development and build resilient, diversified and competitive sectorial economies. The reform is premised on a broad understanding of value beyond mineral revenues and management of mining through a transparent digital technologically driven process" (Jain, 2016).

65 ANM-Colombia refers to the public information provided for its 2022 Coal Round, stating the following: "The bidding period for the 2022 Coal Round began on May 25, 2022, at 9:00 a.m. At the request of prospective bidders, the deadline for submitting bids was extended to July 25, 2022 through Addenda 2, 3, and 4, published on the ANM website and the specialized portal for AEMs" (https://www.anm.gov.co/anm-suspende-la-ronda-minera-de-carbon-2022).

66 "Lastly, he highlighted the use of new technologies, smart contracts and blockchain, a technological initiative that benefits the sector by providing data security, immutable records, traceability, and process transparency. This places the mining sector at the forefront in this area, making it a pioneer by being the first country to implement this technology in its mining business" (opinion of ANM-Colombia president Juan Miguel Durán Prieto in the 2022 Public Accountability Hearing). The full article on the public hearing may be found at https://www.anm.gov.co/la-anm-presento-los-colombianos-las-oportunidades-que-ha-generado-el-sector-minero-en-los-ultimos.

67 "The suspension of these terms will allow the incoming government to have a full and comprehensive understanding of the specific characteristics of the competitive selection process and to perform the analyses provided for in law so that it can take the appropriate decisions" (https://www.anm.gov.co/anm-suspende-la-ronda-minera-de-carbon-2022).

68 See endnote 55 on the notice for the seventh round.

69 For the eighth round, guidance was as follows: "Supporting documents may be accessed through the Participa ANM system, which should also be used to register oral interventions and submit written contributions" (ANM-Brazil, n.d.).

70 Interview with a private sector attorney specializing in bidding processes (William Freire Advogados Associados law firm).

71 "In accordance with the schedule established by ANM, the ratification of the results of the process and award of the acquired areas will take place on October 14, 2024. The successful bidder must make full payment of the amount offered by November 1, 2024, at the latest, and apply for the mining title before November 25, 2024" (William Freire Advogados Associados, n.d.).

72 "In the event that a participant fails to comply with any of the obligations listed in the Notice, they shall be subject, without prejudice to other applicable legal sanctions, to the following penalties: (i) payment of a fine, which may vary between R$2,000.00 and 20 percent of the value of winning bid submitted during the electronic auction; (ii) temporary suspension from participating in processes for available areas for a period of no less than two years and no more than five years; (iii) invalidation of the auction. In the latter case, where the noncompliant party is the winning bidder, the application for mining rights may be deferred or the awarded titles may be invalidated (item 14.1 of the Notice)" (William Freire Advogados Associados, n.d.).

73 Interview with the Manager of the Presidential Commission for Development in Suriname.

74 The timeline for the auction process can be found on the entity's website: https://www.mme.gov.br/energiaemineracaoprobrasil/leilao-palmeiropolis-to-area-da-cprm. In the case of the general bidding processes organized by ANM-Brazil, see ANM order 1,504 of December 18, 2023.

75 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

76 The results of the mining auctions conducted by ANM-Brazil can be found on its official website. At the time of publication, a total of eight bidding rounds had been carried out, the details of which are publicly available. Complete information can be found at https://www.gov.br/anm/pt-br/assuntos/disponibilidade-de-areas/rodadas.

77 For a comprehensive study of competitive bidding rounds since these were launched, including their management objectives and results, see the Regulatory Results Evaluation (ARR) prepared by the Superintendency of Mining Planning and Area Availability, available at https://sei.anm.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?iPKNOI4i-Tt3bdeqzGJgGCgYH-B6kWAvCl8aH0kRl60KApLZ8ijCcbaTgZfY9aX0N_4Ctr4Mvaxc04FuiMC2f9RggrC4VZhowIxnQcXX2KAmChHNgOwpvVlHZCgeAyCe.

78 Interview with the Manager of ANM-Colombia's Vice Presidency for Promotion and Development.

79 It is essential to study the market for the product that is the subject of competitive bidding, as this allows the country to gauge potential demand from companies to participate in the auction.

80 Interview with the Manager of the Vice Ministry for Promotion.

81 Basic data on this type of mineral can be found at https://www.igfmining.org/wp-content/uploads/2022/11/critical-minerals-primer-en-WEB.pdf.

82 For example, through the introduction of new laws concerning the royalty system, as is under consideration during President Lula da Silva's new term in office. However, it is debatable whether this change is a direct consequence of competitive bidding processes or, alternatively, a response to structural changes in other aspects of mining management (BNAmericas, 2023).

3. Mining Resources and Royalties: An Opportunity to Boost Revenue

1 See Azuaje (2020) for a brief discussion of this topic.
2 The U.S. dollar is typically used for mining transactions in LAC.
3 The negative impact of royalties is reduced where a corresponding income tax deduction is permitted.
4 Colombia's Obras por Impuestos (Works for Taxes) program does not reduce royalty payments, but instead deducts them from the income tax base.
5 Depending on the institutional framework, the implementation of laws may require presidential decrees, as in the case of Colombia. In Chile and Peru, the terms of royalties are set out in detail in those countries' laws.
6 See Fleming, Manley, and Lassourd (2023) for further discussion of the challenges of implementing profit-based royalties, as compared with price-based mechanisms.
7 IGF (2022b) discusses the importance of introducing variable-rate (i.e., progressive) arrangements to promote investment in the African context.
8 Although there is a positive correlation between mineral prices and operating costs, the authority does not know the value of this correlation. This is an example of the perception of uncertainty (i.e., imperfect information) that affects royalty calculations.


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