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Taxation of the Extractive Industries

The Valuation of Mining Products for Tax Purposes

Summary

This paper is presented to the UN Tax Committee at its Twenty-ninth Session for a *first reading* and seeks the Committee's suggestions and guidance with the view to revising it for approval at the Thirtieth Session.

This report highlights the critical role of accurate product valuation in preventing profit-shifting in the natural-resources sector, particularly in the mining industry. It reviews available examination techniques for tax administrations and addresses the practical challenges they face in addressing product valuation issues. It also emphasizes the importance of international cooperation and capacity building.

The report draws from discussions with tax officials from mineral-rich countries and other experts. Although topics addressed are not exhaustively covered, this paper aims at focusing on key aspects, offering practical guidance for policy-makers and tax administrators.

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The Valuation of Mining Product for Tax Purposes

I. Background and Purpose of Report

- a. For developing countries with substantial mineral deposits, the extraction and sale of minerals can constitute major potential sources of government revenues. Moreover, mineral deposits are non-renewable, meaning that minerals from a particular deposit can be extracted and sold only once. If the government fails to receive arm's-length compensation in return for the extraction and sale of the deposit, the opportunity to do so is lost forever. For this reason, if the country and its people are to receive the full benefit of the country's natural endowment of wealth, it is crucial for the fiscal authorities to be able to ascertain and enforce payment of the proper amount of the government's take with a high level of effectiveness.
- b. As discussed further below, governments usually apply a combination of two different levies ("fiscal instruments") on the extraction of mineral products: (i) royalties, which often (but, as described below, not always) are imposed as a percentage of the value of the product that is extracted; and (ii) taxes on the net profits of the mining companies that perform the extraction and sale of the product (including corporate income taxes and resource rent taxes).¹ In some instances, other fiscal instruments, including production sharing agreements and other profit-sharing arrangements, also are used. The valuation of extracted product is crucial to the fair application of all these fiscal instruments. In particular, if the extracted minerals are undervalued, government revenue from both royalties and taxes on profits will be unwarrantedly reduced. The accurate valuation of extracted product is therefore an important part of the responsibility that is entrusted to the taxpayers and the tax administrators of mineral-rich countries.
- c. The need to value extracted product for tax purposes can arise in connection with both related and unrelated party transactions. The issue arises routinely when the first sale of product after extraction is made from an extractive company to a related party – that is, to another member of the company's commonly controlled multinational group. The valuation of products in related-party sales generally is referred to as transfer pricing. Sometimes, tax administrators also express concern regarding the possible undervaluation of product when it is sold to either a related or an unrelated party; in particular, the possibility is raised that the extracting company might intentionally alter sales records to avoid taxes and other government levies.² This kind of possible mispricing in sales between both related and unrelated parties is often referred to as trade mispricing.³ This report does not attempt to address the topic of deliberate alteration of records or other intentionally wrongful

¹ See, e.g., United Nations Handbook on Selected Issues for Taxation of the Extractive Industries by Developing Countries (updated edition), chapter 1.3.

² The experience of Ghana illustrates fiscal importance of monitoring the volume of production to prevent both intentional and inadvertent misreporting of sales volumes. See Intergovernmental Forum on Mining and African Tax Administration, The Future of Resource Taxation (2023), <https://www.iisd.org/system/files/2023-06/future-of-resource-taxation-en.pdf>, chapter 14.

³ See UN Handbook, *supra* note 1, chapter 13.10.

practices,⁴ although it should be noted that the valuation techniques described in this report may in some instances be relevant in dealing with deliberate and wrongful mispricing.

- d. Although this report addresses specifically the role of product valuation in natural-resource tax administration, it should be recognized that effective tax administration requires attention to potential transfer pricing issues that do not directly involve product valuation.⁵ These include, among others, issues involving related-party debt; marketing, management, and service fees; and the tax treatment of financial derivatives and intragroup hedging arrangements.
- e. This report incorporates information derived from a series of conversations with tax administrators from minerals-rich countries at different levels of economic development, as well as other experts.⁶ The report (i) describes the importance of effective product valuation in controlling profit-shifting in the natural-resources setting; (ii) reviews the examination techniques that are available to tax administrations in addressing product valuation issues, and describes the practical difficulties that tax administrations face in attempting to address these issues; and (iii) suggests possible means by which governments, assisted by capacity-building from international organizations and national governments, might more effectively address the challenges posed by the valuation of mineral products. In the interest of enhancing its useability, this report is intended to provide relatively brief practical guidance to policymakers and tax administrators and does not attempt to cover exhaustively any of the topics that are addressed. References are provided in footnotes to sources with more extended discussion of important topics.

II. Marketing Hubs and Similar Arrangements⁷

- a. Multinational groups in the natural resource sector often employ a corporate structure in which sales of products from group members that conduct mining operations are not made directly to unrelated customers, but instead are made to a related “marketing hub” company that the group has established in low- or zero-tax countries. The marketing hub then on-sells

⁴ In contrast to situations involving trade mispricing, the presence of normal tax controversy of the kind addressed in this report does not raise any necessary implication of taxpayer misconduct.

⁵ See generally UN Handbook, *supra* note 1, chapter 11.

⁶ Tax officials from Argentina, Australia, Liberia, Mexico, Peru, and Senegal, as well as experts from the OECD, Tax Inspectors Without Borders, the Intergovernmental Forum on Mining, and the International Senior Lawyers Project were consulted in the preparation of this report.

⁷ See, e.g., Alexandra Readhead, Toolkit for Transfer Pricing Risk Assessment in the African Mining Industry, <https://rue.bmz.de/resource/blob/75614/transfer-pricing-risk-tool.pdf>, (2017), 11-22; see also “Example 1, Marketing Hub Taxation,” UN Handbook, *supra* note 1, at 447. Contractually based hub structures and similar intragroup arrangements have been used widely in many different industries for decades. This report does not seek to comment on or otherwise address tax policy concerns raised by these transactional structures but instead aims to provide suggestions for improving the administrative aspects of product valuation in the minerals sector.

Although the marketing hub structure is commonly encountered, it should be recognized that profit shifting can be achieved through mis-valuation in connection with other transactional structures as well. The absence of a marketing hub in a particular situation does not preclude the need for review of the product valuations provided by the taxpayer with respect to its related-party transactions.

the products to unrelated purchasers, retaining a tax-favored profit on the purchase-and-resale, on the basis of intragroup contracts intended to place the financial risks of marketing on the hub company. In the course of the purchase and resale, the marketing hub may obtain only brief legal title to the products sold; the products may be shipped directly from the country of mining to the customer, without physical contact with the country of the marketing hub.⁸

- b. Under a marketing hub arrangement, the taxpayer group has an incentive to place as low a value as possible on the extracted product that is sold to the zero- or low-tax hub.⁹ The tax authority of the country of extraction has the responsibility of examining the taxpayer's valuation, a process that can result in difficult and extended tax controversies.

III. Methods Available to Tax Administrations for the Valuation of Extracted Product

- a. There are two primary means of evaluating the possibility of undervaluation of extracted product in the course of a tax examination. First, it is possible to attempt a direct valuation of the products transferred to the marketing hub in related-party sales. Second, it is also possible to examine whether the marketing hub retains profits that exceed those appropriate to the hub's functions, assets and risks. The discussion below addresses both examination approaches.
- b. The Direct Valuation of Extracted Product¹⁰
 - i. The standard method of valuing natural-resource products for tax purposes involves (i) identifying an appropriate "index price"¹¹, if one exists for the particular product, from published sources like the London Metal Exchange (LME) or COMEX; and (ii) adjusting the index price for factors specific to the particular taxpayer's operations, including adjustments among others for product quality (both premiums and discounts), for the value of any processing of product done within the country of extraction,¹² for transportation and insurance expenses, for production volumes, and for the contractual terms (especially the contract duration) used by the taxpayer

⁸ The hub also may serve as a centralized point for arranging various intragroup transactions including the procurement of equipment or the provision of centralized management services.

⁹ It is possible that widespread implementation of the global minimum tax of the OECD's "Pillar 2" might over time reduce the taxpayers' incentives to make use of tax-favored marketing hubs. It is likely, however, that corporate income tax rate in a particular country will be higher than the 15-percent rate of the Pillar 2 minimum tax, so that use of the marketing-hub structure will continue to offer potential tax advantages. Therefore, even after the new minimum tax is implemented around the world, the valuation of natural resource product is likely to remain an important function of tax administration.

¹⁰ A recent summary of the process of direct valuation of minerals prices is provided by IGF and OECD, *Determining the Price of Minerals – A Transfer Pricing Framework* (2023), <https://www.iisd.org/system/files/2023-11/determining-the-price-of-minerals-framework.pdf>

¹¹ Index prices also are referred to as "posted" prices.

¹² Initial processing of ore near the mine, prior to export, can be economically efficient, and pre-export processing is common in practice.

group in its sales of product to unrelated parties.¹³ In addition, taxpayers may argue that under the facts of the particular case, adjustments should be made for marketing expenses. Determining the appropriate levels of the various adjustments requires the application of a large degree of expertise in mining engineering and in industry economics. The process is further complicated in the case of products like lithium and cobalt, metals for which demand has grown rapidly in recent years, and for which industry-standard valuation techniques are still developing. (The emergence of new projects for production of these and other metals could, however, provide opportunities for producing countries to develop improved fiscal arrangements with producers.)

- ii. Taxpayers and tax examiners frequently disagree with respect to both the identification of appropriate index prices and the adjustments that should be made to those prices, and examinations often involve complex technical analyses. Tax authorities, especially in developing countries with constrained administrative resources, may perceive the need for access to additional expertise to conduct the in-depth engineering and economic studies necessary for the conduct of an effective examination. Moreover, some aspects of valuation, including the adjustments of index prices to account for contract duration, require that tax examiners have access to the taxpayer group's sales contracts with unrelated purchasers, but taxpayers sometimes resist efforts by examiners to gain access to those contracts, claiming that the contracts are subject to confidentiality restrictions. Disputes over access to information can cause examinations to be procedurally as well as substantively difficult. This topic is addressed further below.
- iii. Even with high levels of expertise available to both parties, technical analysis cannot definitively resolve valuation issues, which always involve some degree of subjective judgment. Disagreements generally cannot be resolved entirely on objective grounds, and results typically reflect, to some extent, the parties' relative bargaining power. The negotiation process can be extended and differing views hard to reconcile, so that even under the best of circumstances, the resolution of valuation disputes is likely to be difficult and uncertain. This likelihood places a premium on dispute-resolution techniques that might render the negotiation process more tractable, including the advance resolution of issues under advance pricing agreements or other means of advance resolution, as discussed further below.
- iv. The "Sixth Method"
 - a. Some countries seek to simplify the standard valuation process using what has come to be known as the "Sixth Method."¹⁴ The Sixth Method originated in the context of valuation of agricultural products and was intended to resolve the

¹³ For a list of necessary price adjustments according to the OECD Transfer Pricing Guidelines, *see* note 14, *infra*.

¹⁴ For discussion of the Sixth Method, including analysis of legal issues raised by the method, *see* The Future of Resource Taxation (2023), *supra* note 2, chapter 10; and UN Practical Manual on Transfer Pricing, chapter 4.7 (including an extended discussion of the importance of specifying the point in the production value chain at which index-based pricing should be applied).

basic question whether index prices constitute “comparables” that can be used as the basis for a transfer pricing analysis. Notably, countries applying the method have differed in their views concerning the extent of comparability adjustments that must be made to the index price. If the method is seen as requiring only limited adjustments, the Sixth Method can be seen as an administrative simplification device.

- b.* Significant legal uncertainty surrounds the question whether the limitation of the number of comparability adjustments to be made under the Sixth Method causes the method to depart impermissibly from the arm’s-length principle.¹⁵ It is therefore uncertain whether the Sixth Method offers the prospect of significant simplification of valuation processes.
- c.* This question may be clarified over time. In the meantime, countries’ experience under simplified versions of the Sixth Method should be monitored carefully to evaluate the extent of the method’s promise in simplifying product valuation.¹⁶

c. An Alternative to Valuation Based on Index Prices: Benchmarking the Profitability of the Marketing Hub

- i.* As an alternative to attempts to value extracted products directly, or as a complement to those efforts, tax examiners sometimes seek to determine, generally using the transactional net margin transfer pricing method (TNMM), whether the taxpayer group’s marketing hub is achieving profitability above what would be consistent with the hub’s functions, assets and risks.
- ii.* Benchmarking the profitability of the marketing hub requires that applicable laws provide tax administrations with access to the hub’s financial data, and also to the contracts governing the taxpayer’s resale of products to unrelated customers. As discussed below, some countries do not yet have sufficiently effective information-gathering laws in place. The recent introduction of country-by-country reporting may alleviate this problem to some extent, although the data provided by country-

¹⁵ The OECD Transfer Pricing Guidelines (2022) do not use the phrase “Sixth Method” but do, at paragraph 2.20, contemplate the use of quoted prices as comparables for transfer pricing purposes. Paragraph 2.20, however, suggests that all relevant comparability adjustments must be made in translating the quoted price into an acceptable estimate of an arm’s-length price:

For the CUP method to be reliably applied to commodity transactions, the economically relevant characteristics of the controlled transaction and the uncontrolled transactions or the uncontrolled arrangements represented by the quoted price need to be comparable. For commodities, the economically relevant characteristics include, among others, the physical features and quality of the commodity; the contractual terms of the controlled transaction, such as volumes traded, period of the arrangements, the timing and terms of delivery, transportation, insurance, and foreign currency terms.

¹⁶ Zambia has had significant experience in seeking to limit the extent of permissible comparability adjustments under the Sixth Method in connection with the pricing of copper. The results of that experience should be studied to determine what lessons might be available with respect to the Sixth Method’s potential promise. *See* The Future of Research Taxation, *supra* note 2, paragraph 10.4.3.

by-country reports is not sufficient to support the estimation of tax adjustments solely on the basis of the reports.

- iii. The application of a benchmarking analysis in reviewing a marketing hub's profitability is not simple. It requires many subjective judgments, including those regarding the selection of "uncontrolled comparables," and attempts by examiners to benchmark hub profitability have given rise to difficult tax controversies. Nevertheless, the benchmarking approach may be less demanding, overall, than the direct valuation of product.¹⁷

IV. Other Possible Means of Reducing Difficulties of the Valuation Process

a. Administrative Pricing

- i. The taxpayer is the first mover in a potential valuation controversy, when it files the tax return that is based on the taxpayer's own valuation. The tax authority then is in the position of challenging the taxpayer's valuation if a challenge appears warranted. Under this structure, although formally the burden of proof may fall on the taxpayer, as a practical matter a court or other review authority may place a heavy burden of persuasiveness on the government in its role as the challenging party. Especially given the uncertainty inherent in product valuations, the government may need to present a very strong case in order to succeed in a challenge to the taxpayer's initial position.
- ii. Administrative pricing offers an alternative to the traditional tax reporting structure in which the taxpayer is the first mover in valuation. The most prominent instance of administrative pricing is that which has been maintained since the 1970s by the Government of Norway for valuing North Sea oil production.¹⁸ Under the Norwegian system, a government authority establishes daily prices for oil production, based on prevailing global price levels as well as adjustments that the authority considers necessary to determine an arm's-length price. Taxpayers may appeal the government's valuation, but appeals are rare, and the administrative pricing system has been functioning smoothly for many years.
- iii. It is not clear, however, that a system like Norway's could be applied to hard minerals. Oil is a relatively uniform natural-resource product with relatively clearly defined grades of product quality, and the oil market is tracked by well-accepted index prices for the different grades. Similar uniformity and well-accepted product quality grades often are not present for hard minerals. Indeed, Norway does not

¹⁷ The Australian Taxation Office has provided guidance to taxpayers regarding the ATO's approach to assessing compliance risk based on the profitability of marketing hubs. <https://www.ato.gov.au/law/view/pdf/cog/pcg2017-001.pdf>

¹⁸ See Norwegian Petroleum, "The Petroleum Tax System," <https://www.norskipetroleum.no/en/economy/petroleum-tax/#:~:text=This%20entails%20a%20special%20tax,and%202023%20is%20shown%20below.>

extend its oil pricing system even to natural gas, since pricing criteria for natural gas are not as well defined as they are for oil. (It should be noted in this connection that the uniformity of exported products might be increased where initial refining or other processing of the product occurs in the country.) Moreover, Norway had very substantial economic leverage over oil producers at the time of initial exploitation of the North Sea fields, a situation which might not be present with respect to hard minerals deposits in countries around the world. In view of the possible procedural benefits of administration pricing, careful further consideration should be given to the possibility, but administrative pricing similar to the Norwegian system for oil may be of limited applicability to hard minerals pricing.

- iv. Safe Harbors – A variant of administrative pricing is the provision by governments of safe harbors for mineral pricing.¹⁹ Under a safe harbor, the taxpayer is protected from adjustment if the taxpayer’s pricing conforms to the prescribed safe-harbor guidelines. A safe harbor is not mandatory, however, and the taxpayer is free to adopt more favorable pricing at the risk of tax-administration challenge. The optional nature of safe harbors raises the question whether they would change taxpayer behavior significantly in the natural resources setting. To date, the use of safe harbors in natural resource taxation has been relatively limited.²⁰

b. Advance Pricing Agreements

- i. Advance pricing agreements (APAs) are advance agreements (sometimes called “arrangements”) with respect to acceptable transfer pricing methodologies, into which governments enter with taxpayers in a wide range of industries.²¹ APAs are seen around the world as a standard tool for providing increased predictability in transfer pricing administration. To date, at least one APA has been completed by a developing country in the field of hard minerals pricing.²² (Notably, that APA extends only to the determination of prices for royalty purposes and does not extend to valuation for income-tax purposes.)
- ii. The extent to which APAs or other forms of advance agreements might simplify the task of minerals valuation is inherently limited. Although an APA might incorporate agreement on the choice of an index price or prices, as well as on the particular adjustments to be made to the index price, an APA may not be able to incorporate agreement on all of the parameters that must be measured in computing the adjustments, including for example how adjustment for contract terms might be

¹⁹ See generally IGF/OECD, Determining the Price of Minerals, *supra* note 10 at 27-29; UN Transfer Pricing Manual, *supra* note 14, chapter 5.5 ff.

²⁰ It may be useful, in assessing the possible usefulness of safe harbors, to study the experiences of Guinea, <https://www.igfmining.org/impactstory/guinea-bauxite-reference-price/>, Senegal, <https://www.igfmining.org/impactstory/setting-a-benchmark-price-for-phosphate-to-bring-financial-benefits-to-senegal/>, and Sierra Leone (supported through IMF FAD TA).

²¹ See generally UN Practical Manual on Transfer Pricing, *supra* note 13, section 15.3.4.

²² See Stephen E. Shay, “Negotiating a Royalty Pricing Agreement: Lessons from Liberia” (2020), <https://oecd-development-matters.org/2020/06/18/negotiating-a-royalty-pricing-agreement-lessons-from-liberia/>

calculated as the underlying facts change over time. An APA also typically contains “critical assumptions” that can require the APA to be renegotiated if specified facts change. In addition, even the most carefully structured APA may not close off all avenues for profit shifting, as an APA, while addressing product valuation, might not cover other related issues like the assignment of hedging costs to particular members of the related-party group. Nevertheless, although an APA or similar advance agreement cannot resolve all areas of potential disagreement, the choice of index price and the listing of adjustments to be made in product valuation could substantially simplify the audit process, and negotiation of an APA or similar advance agreement may well be cost-effective in the right circumstances.²³

- iii. Sometimes, an APA is used to resolve audits for completed tax years as well as agreeing on pricing methods for future taxable years. This use of an APA is generally referred to as a “rollback.” Using APAs in this manner can significantly increase the benefits provided by the agreements.
- iv. It is not necessary for a tax administration to establish and staff a formal APA process to achieve the administrative benefits of an advance agreement, as this can be very resource intensive and may shift resources from the uncompliant to the largely compliant taxpayers. The same kind of agreement on pricing method can be incorporated in a concession agreement or other contractual arrangement as can be incorporated in a document that is formally labeled as an APA.²⁴

c. Greater Reliance on Royalties in the Fiscal Mix

- i. The enhancement of examination and negotiation techniques is not the only means by which the process of valuation might be improved. In particular, the relative weighting of royalties and income-based taxation within a project’s fiscal mix could have significant bearing on the efficiency of examination and resolution of valuation issues.
- ii. In particular, royalties based on gross product value offer important administrative advantages which may not always be taken adequately into account in determining the most desirable fiscal mix.²⁵ Perhaps most importantly, the revenue yield from royalties is less vulnerable to the undervaluation of product than the yield from

²³ An APA can be either “unilateral,” in that it involves agreement between the taxpayer and a single country’s tax authority, or “bilateral,” in which case the APA also involves agreement by the competent authorities of both countries that are involved in the covered transactions. In fact, APAs can involve more than two countries. In the context of mineral product valuation, a bilateral APA might be helpful in avoiding double taxation if the countries on both sides of the covered transactions impose tax at relatively high rates. It may be noted that if the implementation of the OECD’s Pillar 2 proposal results in a general increase in tax rates in countries that serve as hosts for marketing hubs and similar arrangements, the possibility of double taxation might become a more prominent consideration than it is today.

²⁴ The term of a concession agreement or similar document might be longer than would be desirable for an APA. If that is the case, provision can be made for periodic renewal of the agreement on pricing method at a desired interval within the longer term of the underlying concession agreement or other governing contract for a project.

²⁵ Some royalties are based not on gross revenue but instead on net income from a project. Generally, royalties based on net income do not offer the administrative advantages discussed in this report.

income-based taxes. Consider, for example, a taxpayer in the mining industry in a country that imposes corporate income tax at a rate of 35 percent and a royalty of 4 percent.²⁶ Assume as well that the correct fair market value of product extracted during the year is \$100,000,000, and that the company's deductible expenses are \$90,000,000, so that the company's correctly measured taxable income is \$10,000,000, and its correct level of income tax is \$3,500,000. Assume now that the company understates the value of its extracted product by 5 percent, or \$5,000,000. The amount of the royalty is reduced by five percent, from \$4,000,000 to \$3,800,000, a difference of \$200,000. The government's revenue under the income tax, however, is reduced from \$3,500,000 to 1,750,000, a reduction not of five but instead *fifty* percent.

- iii. Other administrative advantages of royalties based on gross product value include:
 - a. Royalties based on gross product value are not vulnerable to transfer pricing issues related to various taxpayer business deductions, including deductions for related-party management fees and intellectual property royalties. Similarly, royalties are not vulnerable to excessive payments of interest or interest-equivalents to related parties.²⁷
 - b. Royalties based on gross revenue do not require "ring-fencing" rules designed to prevent taxpayers from distorting the apportionment of deductible expenses among different, separately taxed projects within a country.
- iv. The importance of administrative considerations in determining the fiscal mix should not be overstated, as many other factors are relevant to the optimal weighting of royalties and income-based taxation. These factors include, among others, (i) the general view of investors that royalties subject investors to greater financial risk than income-based taxation, since royalties may be imposed from the beginning of production, before the investor has begun earning profit; and (ii) the countervailing desire of governments for a fiscal mix containing a substantial royalty component, since this provides the government with cash flow even in the early stages of production.
- v. Variable Royalties²⁸
 - a. Countries often seek to resolve, at least partly, the economic disadvantages of royalties by fashioning variable royalties that are based on the gross value of

²⁶ This example is hypothetical, and the facts are not those of any particular extractive product or any country's particular fiscal mix. Different assumptions as to royalty rate, income-tax rate, and taxpayer profitability would yield different results, although income-based taxes should in all realistic circumstances be more sensitive to product undervaluation than income-based taxes.

²⁷ Examination of taxpayer business expenses may, however, be necessary under a gross-income based royalty where appraisal is conducted at a "downstream" point in the product value chain, for example where the product has been subject to post-extraction refining or other processing. *See* Jack Calder, *Administering Fiscal Regimes for Extractive Industries* (2014), chapter 2.

²⁸ *See generally* The Future of Resource Taxation, *supra* note 2, chapter 9.

extracted product but are adjusted in a manner designed to approximately track the investor's profitability. For example, the rate of a particular variable royalty might rise and fall according to changes in the index price of the extracted product and in the taxpayer's production volume. A variable royalty must be designed carefully, to reflect the likelihood that a mining company's costs will increase in correlation with increases in index prices.

- b. Even with the most careful design, a variable royalty is not intended to track the taxpayer's net income precisely. A variable royalty could, however, permit a country to benefit from the administrative advantages of royalties while at the same time tracking taxpayers' net income sufficiently well to limit business risks.
- vi. Overall, although administrative considerations should not be given excessive weight in the determination of a minerals project's fiscal mix,²⁹ countries might consider a fiscal mix weighted more toward royalties, especially variable royalties, than might have been seen as desirable in the past.
- d. The importance of information-gathering authority – As discussed above, tax examiners have legitimate need for access to various kinds of taxpayer documents of taxpayer group members located outside the country of the mining operation that is under audit. These include financial records of the marketing hub or similar entity that are necessary to benchmark that entity's profitability. In addition, examiners need copies of sale and purchase contracts between group members and unrelated customers to be able to track profits from the purchase and resale of particular products. Countries should review whether their statutes and regulations, in connection with information-exchange agreements between countries, are sufficient to enable their tax administrations to compel access to necessary information held by taxpayers' foreign related parties. Although governments may encounter opposition in seeking to strengthen information-access laws, effective access to information is necessary to permit reasonably thorough tax examinations.
- e. Technical Assistance and Capacity Building
 - i. International organizations, including Tax Inspectors Without Borders, the United Nations, the IMF and World Bank, the IGF, OECD and the African Tax Administration Forum, as well as national governments, currently provide technical assistance to developing countries in tax administration, including the administration of extractive-industry taxation. Technical assistance over the years has been helpful to many developing country tax administrations and appears to have contributed to enhanced revenue collection.³⁰
 - ii. It should be considered, however, whether technical assistance in the area of extractives taxation could be substantially enhanced. Current technical assistance efforts include classroom instruction for tax administrators, as well as the medium-

²⁹ In this connection, Calder, *supra* note 27, cautions generally that the administrative benefits of royalties can easily be overstated.

³⁰ See generally the annual reports published by Tax Inspectors Without Borders, available at tiwb.org.

and long-term provision of advice, but generally not active participation in examinations. In view, however, of the many different kinds of expertise required for effective extractive-industry tax administration, and the likely advantages of learning-by-doing compared with classroom-style instruction, it should be considered whether a means might be found for providing technical assistance through the direct and sustained participation in examinations by recognized experts in leading complex tax examinations and in minerals engineering,³¹ industry economics, and the financial modeling of extractive-industry projects.³²

- iii. An especially effective model for technical assistance and capacity-building might be based on the secondment of resident experts, who could serve as formal members of examination teams. Experienced experts could be sourced from national tax administrations and, perhaps, from among retired private-sector or other experts. Of course, significant legal issues, including the need to ensure compliance with countries' taxpayer confidentiality rules, will need to be addressed if seconded experts are to take part directly in examinations. Costs will also be considerable.³³ Overall, the challenges involved will be substantial. Nevertheless, the legal and financial challenges of extended hands-on involvement by experienced seconded personnel would seem surmountable if there is whole-hearted political commitment on the part of the governments and international organizations that would be involved.³⁴ The potential benefits of the envisioned model of technical assistance, in terms of enhanced administrative effectiveness and long-term capacity building, might be substantial.
- iv. Long-term direct involvement by experienced providers of technical assistance is an appropriate model not only with regard to tax examinations, but also to the equally complex processes of designing and drafting necessary statutes and regulations, and in negotiating concession agreements and other governing instruments for natural-resource projects. The expertise involved will extend beyond the field of tax administration, but the model of long-term hands-on involvement by experienced experts, working directly with host government personnel, would seem potentially cost-effective beyond as well as within the field of taxation.

³¹ An important area in which technical expertise is often needed is the measurement of product quality, which often requires the use of mineral laboratories. *See generally* Alexandra Readhead, *Monitoring the Value of Mineral Exports: Policy Options for Governments* (2018), <https://www.igfmining.org/resource/monitoring-the-value-of-mineral-exports-policy-options-for-governments/>. *See also* the discussion of Ghana's experience in *The Future of Resource Taxation*, *supra* note 2, chapter 14.

³² The importance of government access to high-quality economic modeling of proposed minerals projects cannot be over-emphasized. It is fair to say that state-of-the-art modeling capacity is essential if governments are to negotiate effectively with natural-resource industry investors. It is also common and best practice for the investor to be required to share its model with the government.

³³ Cost savings might be available if an expert could simultaneously provide long-term assistance to more than a single country.

³⁴ Tax Inspectors Without Borders, which is supported in both funding and expertise by the OECD and the United Nations Development Programme, and which has substantial experience in hands-on technical assistance, may play a role in designing and implementing a system of long-term secondments.