MINERAL TAXATION – DESIGN ISSUES

The need for government intervention in the mineral sector through appropriate levy instruments is well recognized. Although several experts such as Hotelling proposed that the market could take care of the optimal extraction of minerals through price and interest mechanisms, the applicability of the principle is limited by factors like continuous exploration for new deposits, substitution possibilities of the mineral, technological advances in not only mineral extraction but also in the overall economy, and market failure (government intervention). The Hotelling principle might avert a sudden exhaustion of a mineral, but it may not automatically provide intergenerational equity in mineral extraction. The conditions mentioned for intergenerational equity are also restrictive, not generally satisfied, and call for government intervention. In addition, studies relating to mineral-dependent economies emphasize the need to achieve sustainable development – that is, continuing the economic growth achieved by the initial push given by the discovery and extraction of minerals even after their exhaustion. Many economists believe that with proper government planning for achieving higher capital and technological progress, natural resources will not be a constraint to sustained economic growth. On the contrary, without planned mineral development, mineral-rich economies could be prone to such maladies as the “Resource curse” and the “Dutch disease.”

I. INTRODUCTION

Mineral taxation has been receiving wide attention in recent years. It is a well-recognized fact that government intervention through tax policy instruments is essential for optimal exploration of mineral reserves, maximization of mineral rents, maintenance of environmental standards, and for providing incentives for reinvestment of mineral rents. In each country, there exists a gamut of levies, each with a plethora of components impinging on the mineral sector at various stages of prospecting, exploration, trade and final consumption. The high risk, high capital-intensity characteristics of the mining activity coupled with long gestation lags involved in prospecting and extraction call for special tax treatment of the sector. As international capital flows are guided by the prevailing fiscal regimes, it is important for prospective investors to know what types of taxes can be expected on mineral sector activity in general, and what is the scope for their harmonization across the countries. This paper examines the broad trends in the mineral tax practices around the world and aims to bring out the main causes of cross-country variations.

This paper examines the mineral levy practices around the world and aims to bring out the broad trends in the tax treatment of the sector. It also makes an attempt to probe into plausible causes of intercountry variations in the mineral levy regimes. Section II briefly discusses some of the issues in the taxation of minerals, while sections III. and IV. examine the broad trends in the mineral levies through tax, non-tax and other instruments practised around the world with the help of a sample of 15 important mineral countries.
'Tax policy is an important instrument of government intervention in any sector, including minerals. While taxing the mineral sector, three types of objectives can be envisaged. The first set of objectives emanates from the role of government as an agent responsible for achieving economic and social development. Here, government has the responsibility to ensure that the mineral extraction is socially optimal and equitable, and at the same time, the sector makes due contribution to public revenues in the same manner as other sectors of the economy to promote sustainable economic development. To fulfil these goals, the system of mineral levies should be characterized by the generally acclaimed principles of certainty, fiscal stability, and administrative convenience apart from neutrality. As mineral sector operations involve high risk, high capital intensity and long gestation periods, fiscal stability and certainty characteristics are all the more important. Ensuring reasonable stability in the fiscal environment and reducing variability and uncertainty is essential if private sector participation is to be encouraged. The risk that future governments may change the contractually agreed-upon fiscal rules has an adverse impact on investment decisions and therefore, should be minimized. In addition, a mineral levy system should also facilitate ease in administration, adaptability in terms of reduced government-risk and reduced delay in tax remittances.'

The second set of tax objectives arises from the role of government as owner of minerals that requires the government to secure an appropriate share in the mineral rent. If a valuable mineral is extracted, the government should receive not only the regular tax but also a separate payment over and above it. Maintaining the neutrality characteristic of mineral taxation is all the more important in fulfilling this objective. The appropriation of the mineral rent should be, as far as possible, without disturbing the allocative decisions of economic agents involved, unless there is need for deliberate measures to resolve conflicting interests between the objectives of private agents and social welfare considerations. Traditional efficiency considerations also lead to a choice of fiscal instruments that do not distort investment and production decisions. The third set of objectives aims at minimizing the damage to the environment and ecological balance.

Given these three types of motivations for mineral taxation, the specific issues in the taxation of mineral resources faced by government in any country are: (a) how much to tax, (b) whether a separate tax regime is needed for the mineral sector, and (c) how to combine different levies in a multi-levy system.

A. How much to tax

In so far as government has the responsibility to ensure that the mineral extraction is socially optimal and equitable, the levy system would be purely regulatory in nature and therefore not much revenue is expected. It is only when the mineral sector is expected to make due contribution to public revenues in the same manner as other sectors of the economy, that revenue expectations come to the fore. However, the fundamental dilemma faced by a government in respect of the additional government’s share in the mineral rent. This issue assumes greater importance as increasingly private sector companies enter the mineral sector.

Unlike other sectors of the economy, government as owner of mineral resources can claim a sizeable share in the mineral rent. Conceptually, the entire mineral rent (in the Ricardian sense) can be taxed. It is important, however, to ensure that the private sector’s incentive for mineral extraction is not affected in an adverse way. The entire return on capital cannot be regarded as pure mineral rent. It is composed of not only the cost of risk-free capital (opportunity cost) but also various risk premiums that are associated with the sector. Then there are certain “quasi-rents” in the Marshallian sense. In the simplest sense, mineral rent is the supply price less the cost of labour supplied.
plies, equipment, cost of risk-free capital, and quasi-rents. In practice, it is not easy to identify the exact magnitude of mineral rent.\(^{14}\)

B. General v. special taxes on minerals

The special character of the mineral sector and the dual nature of the role of the government lead to the dilemma, whether taxation of the mining sector should be different from the general system in terms of rate structure and administration. Taxes of general application may not always be suitable for mineral companies involving high capital intensity and long-gestation lags. At the same time, exempting mineral companies from general taxation is administratively inconvenient and also against equity principles. Further, it is difficult to prejudge whether exempting the mineral companies from general taxation and subjecting them to only special taxes would promote or detract from the neutrality of the whole taxation system. The distortions created by the special fiscal treatment of mining may not be equal to the distortions removed by the abolition of general taxes. The case for exemption is strong only when the general taxes are distortionary.

This discussion is particularly important in the case of whether other more neutral mineral rent taxes should replace standard corporate income tax. A proportional corporate income (or profit) tax with depreciation deduction could be neutral as between projects and techniques only under certain conditions that can never strictly be fulfilled. For instance, the tax depreciation rarely equals the “economic” true depreciation and is usually calculated on some arbitrary rule. As such, the tax may result in discrimination between different time patterns of receipts and hence between different techniques, products and industries. This argues in favour of more neutral mineral rent taxes relative to the standard corporate income tax.

C. Multiple fiscal instruments

Finally, as there are unavoidable trade-offs between revenue, risk and timing of the revenue receipts, use of multiple fiscal instruments is unavoidable combining judicially the three sets of objectives. One set of levies represent government’s general tax power – basic income tax, import duties, export taxes, sales tax, value added tax, property tax, stamp duties. The second set comprises those that are levied to claim government’s legitimate share as mineral owner – for example, progressive profits tax, supplementary income tax at higher rates, and so on. Two cash-flow variants of the income tax, the enterprise rent tax and Brown tax (see below) are under experimentation. Non-tax instruments such as royalties, product sharing and equity sharing are also used for this purpose. Other imposts like environment taxes are used to minimize the damage to the environment and restore the ecological balance.

III. TYPES OF MINERAL LEVIES AROUND THE WORLD – TAXES

Among the direct taxes, income tax is generally the most common instrument used in almost all the mineral-producing countries of the world. In some countries, in addition, mineral sector-specific taxes such as a higher rate of income tax and progressive profits tax for minerals have also been in existence.

A. Income tax

Income tax (or corporate tax) is the most important levy on the mineral sector although it is levied as part of the government’s general tax power. Generally, the income tax system comprises a basic rate structure (usually one rate), provisions for deduction of certain items from the tax base, supplementary levies, tax incentives and withholding provisions.

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\(^{14}\) Garnaut and Ross suggest making a distinction between three types of mineral rents taking into account short-term, medium-term and long-term costs. In the short-term the cost is due to the variable costs involved in extracting the ore from established mines, in the medium-term it is related to the total cost of producing ore from new mines based on known mineral deposits, and in the long-run it is related to the costs including prospecting costs. (Garnaut, R. and A. Clunies-Ross, Taxation of Mineral Rents (Clarendon Press, Oxford: 1983.).

1. Basic rate structure

The basic rate usually is a single rate. However, there could be multiple rate categories. For example, small companies in Brazil can choose from many options. In Chile, small and medium companies may be assessed on presumed income and small-scale miners are subject to a single tax which is withheld by purchasers of mining products, based on a percentage of the net price of mining products. In federal countries such as Canada and the United States, companies are normally liable to both the federal as well as provincial income taxes and the approximate combined federal provincial rate works out to be 31.97% after taking into account the 25% resource allowance. Currently, the overall corporate income tax rate in several countries is in the range of 30% to 35%. In addition, in countries such as Canada, the United States, India and so on there is a minimum tax applicable to safeguard against undue tax avoidance.

There are certain issues pertaining to the applicability of general income tax to mineral companies that need to be looked into. The first issue relates to the tax depreciation provision along with certain deductions, incentives and withholding taxes.

2. Tax depreciation

The tax depreciation allowance is provided under the income tax regime separately for equipment and buildings, the general rate in many countries being around 25% for equipment and 2% to 10% for buildings.

The tax depreciation issue is one of the most important when it comes to mineral companies. Owing to large initial capital outlays incurred by mineral companies in exploration and development of mineral projects, there is a worldwide felt need for generous depreciation deductions. Consequently, several countries allow accelerated depreciation for equipment used in mining, the period of expensing not exceeding three years. Argentina for example, allows 60% of the infrastructure cost to be claimed in the first year and 20% per annum during the next two years. In Brazil, the accelerated depreciation is linked to the number of shifts for approved mining projects. In Canada, equipment used in new mines is allowed 100% depreciation. In Chile, the taxpayer may use an accelerated depreciation system by directly reducing the useful life of the asset by one third, provided that the useful life of the asset exceeds five years. In almost all the countries, with a few exceptions such as Mexico, the tax depreciation claim is not indexed for inflation. In addition, some countries also allow depletion allowances for exploration costs.

3. Allowable tax deductions for costs

The second issue pertains to the allowable tax deductions. Apart from depreciation of assets, certain other types of costs that include the following are allowed to be deducted for calculating net taxable income:

(1) feasibility study cost;
(2) pre-production exploration costs;
(3) development costs;
(4) post-production exploration costs;
(5) operating costs;
(6) post-production costs;
(7) interest on long-term debt;
(8) royalty payments;
(9) withholding taxes on interest, dividends, fees for technical assistance;
(10) import duties on equipment;
(11) export duties;
(12) excise/sales tax on equipment and services;
(13) fees based on land area;
(14) payroll taxes; and
(15) stamp taxes.

Among these, deductions that are most specific for mineral companies are (1) through (4) and those from (5) through (15) are applicable to non-mineral sector companies as well.

As regards the special tax deductions for the mineral sector ((1) through (4)), there are different methods of expensing allowed. Costs incurred in respect of feasibility study, pre-production exploration costs and development costs are usually amortized to be deducted annually starting within a stipulated minimum period (four to five years after the commencement of production) and up to a maximum period (10 to 15 years). In Canada no limits exist and the costs can be expensed either immediately or can be carried forward indefinitely. In Chile, feasibility costs and the prospecting, exploration and other reconnaissance expenses must be treated as organization and start-up expenses and may be amortized over up to six years, as from either the date on which they were incurred or the year in which income producing activities commenced.

4. Tax incentives

Besides the allowable deductions, it is common practice to give tax incentives to companies – not necessarily operating in the mineral sector alone. Losses carried forward and backward, tax holidays and tax credits for research and development, are the commonly allowed tax incentives. Business losses are allowed to be carried forward or backward for a specified number of years. The number of years for which the losses can be carried forward are usually seven to eight years, while for carrying backward, the number of years are less than four years. Sometimes a distinction is also made between capital and non-capital losses. Tax holiday is another commonly observed tax incentive. Unlike for companies eligible in other sectors for which the tax holiday period is limited to five or eight years, there are instances where tax holiday is given for ten years for eligible mineral companies (for example, Brazil).

In addition, mineral companies are given certain special incentives such as "resource allowance", "processing allowance", "foreign re-investment allowance", and "re-investment deposit allowance".

a. Resource allowance and processing allowance

Notable among the tax incentives specifically given for mineral companies is the resource allowance and processing allowance in Canada. These are simply additional deductions from the mining profits base. The resource
allowance is calculated as 25% of defined resource profits.16

The objective of granting processing allowance is to ensure that mining tax would be imposed only on profits from the extraction of the ore, and not on profits from associated mineral processing operations. The allowance is calculated annually on the original cost of all processing assets, at a rate based on the degree of processing achieved.17 The percentage of income that is offset by the processing allowance depends on the relative importance of the processing assets and on the profitability of the operations. At moderate levels of profitability, this allowance could effectively offset 15% to 25% of income after deductions in the case of gold, and 30% to 50% in the case of copper.

b. Foreign re-investment allowance

China has an ingenious method of encouraging foreign private investment. If foreign investors use profits from their enterprise to directly reinvest in the mineral enterprise or launch another foreign-funded mineral enterprise with a five-year operation period, 40% of the income tax paid on the amount of income used for reinvestment is returned to the investor.

c. Reinvestment deduction

In countries such as Ethiopia and Papua New Guinea, mining companies are entitled to a tax deduction of an amount equal to 5% of gross income to be reinvested in other mining operations or in other investments. In Peru, the entire reinvestment without any limit is allowed as a tax deduction.

5. Tax stabilization provision

It is not unusual to provide a stable tax rate structure for mineral companies. Mining agreements in Indonesia contain provisions for keeping the applicable tax rate structure stable over a specified period.

6. Withholding taxes

The issue of withholding taxes is especially relevant for tax harmonization across countries. Many countries tax the worldwide income of their companies and allow a foreign tax credit in the domestic tax liability. Investors from these countries would like to have the host country’s income tax system harmonized with their systems to keep the administration simple. High withholding taxes on expatriated profits severely affect the viability of investment decisions. Double taxation agreements mitigate the burden to some extent. Withholding taxes are applicable to all forms of income but the rates differ according to the nature of income. The rate applicable for interest payments is different from that on dividends remitted abroad and salaries and fees paid to foreign consultants. The statutory rates of withholding tax on remittances by way of interest payments or dividends abroad or salaries and fees paid to foreign consultants range from zero to 35% (Chile) while the effective rates vary within a narrow band of 5%-10% due to tax treaties.

7. Supplementary taxes

With a view to gaining their legitimate share as mineral owners, governments in some countries attempt imposing additional levies such as prescribing higher or progressive rates of tax for mineral companies and levying rent resource taxes.

a. Higher rate of income tax (HRIT) and progressive profits tax (PPT)

For example, the Indonesian government taxes profits of its petroleum companies at a higher-than-normal rate (Garnaut and Ross (1983)). The advantage of imposing higher rates of income tax is that there is no need to design any special tax and the existing income tax system can be made use of. Income tax has the main advantage of sharing the risk, which the mineral companies prefer and therefore, is superior to the fixed fee or royalty system. However, income tax administration becomes more complex and the rate determination is not easy. Too high a rate delays and deters the projects, while too low a rate affects revenue flow.

In some other countries, the higher rates are applied progressively on a project by project basis. The PPT follows the same principle as an individual income tax. A more profitable project is taxed at a higher rate than a less profitable one. The usual method for this is to tax, at a higher rate, profits above a certain stipulated limit. The limit is prescribed in terms of capital. Whenever the profit-capital ratio rises above a certain threshold level, the higher rate is applied on the additional profits.18 Here, the tax depreciation issue might again crop up. Whether tax depreciation is to be used to reduce the value of the capital for the purpose of deciding the profit-capital ratio to be compared to the threshold ratio poses a problem. There are two variants of the PPT – one that takes into account capital after deducting accumulated depreciation, and the other that uses undepreciated capital. The second variant is less severe as deducting depreciation from the capital for assessing the extra tax increases the tax collected. Using the depreciated capital, however, makes the additional tax more neutral and it approaches the rent resource tax.

The PPT is in existence in a number of countries, prominent among them being the United Kingdom, Canada,

16. Defined resource profits include income from the production and processing of ore to any stage that is not beyond the primary metal stage minus expenses that may reasonably be regarded as applicable to that production but not including financing expenses or most exploration or development expenses. (See Otto, J., Mineral Sector Taxation Methods: A Global Review in Mineral Industry Taxation Policies for Asia and the Pacific (United Nations, New York: 1992).)

17. In Ontario, Canada, the processing allowance rates are as follows. Where a mineral ore is processed only to a concentrate stage, the applicable rate is 8% of the concentrating assets. However, if the ore is processed to the refining stage in Northern Ontario, the processing allowance rate is 20% of the combined cost of concentrating, smelting and refining. In addition, the allowance may not be less than 15%, nor more than 65%, of mining/processing income after deducting all expenses. (See Otto, J., Mineral Sector Taxation Methods: A Global Review in Mineral Industry Taxation Policies for Asia and the Pacific (United Nations, New York: 1992).)

18. Thus, if the accumulated investment amounted to USD 100 million and the threshold for additional tax were 15%, then taxable profit up to USD 15 million in any year would be taxed at the normal rate, say 30%, but profit in excess of USD 15 million would be taxed at a higher rate, say 50%, so that the additional tax would be the extra 20% on annual profit in excess of USD 15 million.
Indonesia, Brazil, Papua New Guinea, Australia, South Africa and Kazakhstan. The principle of PPT has been applied to the copper, gold and silver projects of Bougainvillea Copper Limited in Papua New Guinea, and also in a highly diluted form to oil investments in the UK sector of the North Sea, for which the additional profit tax is referred to as the “petroleum revenue tax”. It has been incorporated in a modified form into Indonesia’s “third generation” mining agreements. In Australia, a special tax is applied to income from the base metal mines at Broken Hill. In Brazil, taxable profits up to BRL 240,000 are charged the nominal income tax at 15%, profits above this amount are taxed at 25%. In Canada, a federal large corporations tax (LCT) is in existence with a rate of 0.225% of the taxable capital in excess of CAD 10 million, not deductible for computing federal income tax. The corporate tax is creditable against the LCT and carry-forward of credits is permitted. Kazakhstan offers by far the most complex PPT so far. The PPT there is based on the magnitude of Internal Rate of Return (IRR).19

The PPT has its burden more clearly linked to profitability, and entails lower risk to investors than applying a uniform higher rate of income tax for all mineral companies. It also has an administrative advantage over some other profit-based taxes as it can use existing tax legislation without much modification. However, the problem of defining capital investment remains. In addition, relative to fixed fee and royalty, the PPT being an income tax, has the disadvantage connected with the problems of definition and assessment.

b. Resource rent tax (RRT) and Brown tax (BT)

The PPT often taxes two projects with the same net present value (NPV) differently if they have different time patterns of cash flows. This is largely avoided with an (RRT).20 The RRT is similar to a cash-flow tax but is imposed only if the accumulated cash flow is positive. It captures a share of mineral rent, which is the return over and above the company’s cost of capital. In practice, all cash inflows and outflows generated by the project are summed in each year to give a net inflow figure. The net cash-flow figures are accumulated year by year at an interest rate until a cumulative positive value is attained. That value is then taxed at a specified tax rate. As long as subsequent annual net cash-flows are positive, they are taxed. If in any later year the net cash flow turns out to be negative, then from that year onward the net inflows are not taxable. The negative cash flows are accumulated again at the specified interest rate until a cumulative positive value is attained.

The RRT shares the returns more than the company’s opportunity cost of capital, and does not distort investment decisions. It is thus viewed as superior to other fiscal instruments such as royalties or production-based taxes or even the conventional profit-based taxes. Another advantage of the RRT is that it automatically provides stability in the tax system as revenue is linked to profitability.

Despite this theoretical attractiveness, the RRT can discourage exploration in practice. Investors know that they will be taxed on highly successful projects, whereas unsuccessful projects will not be compensated. Consequently, the RRT reduces the expected return from exploration, and distorts exploration decisions. Also, excessive capital or a reduced rate of production will be encouraged if the RRT discount rate for cash-flow accumulation rate is set above the company’s discount rate, which will vary from company to company and can never be known with certainty. For example, assume a company’s discount rate is 15% and that used for RRT is 20%. In the absence of the RRT, the company would just be willing to invest USD 1 million today if it will receive a payback of USD 1.15 million a year from now. With RRT, this investment would not be viable. The RRT is a high-risk measure for a government looking for a return on mineral ownership. Although the revenue could be sizeable in favourable circumstances, there is also a possibility that mineral development will yield little revenue.

Administratively, the introduction of the RRT would require definitions of the assessable receipts and deductible payments—the positive and negative cash-flows that are netted and accumulated to form the base of the tax. Since a mining company often has diverse interests, some definition is needed of the receipts and expenses of the project or activities to be taxed. Broadly, all receipts and payments concerned with the project are included except those that are capital, dividend, or interest transactions with equity-holders, creditors or debtors. The fact that the tax is based on cash flows, rather than income, means that there is no need to have rules for depreciation or for valuation of stock, two of the main sources of problems of income tax legislation. There is also no need to define capital as in the case of PPT.

In summary, the RRT can be used to capture mineral rents that are not collected by royalties and help fiscal stability by linking revenue to profitability. But it cannot be relied on as a major fiscal instrument.

The RRT has been embodied in legislation in Papua New Guinea as an additional tax applying to future projects for extracting metals, petroleum and gas. However, it is not known to what extent it can be administered successfully as it applies to only one very large project in process of development, in which it was acceptable to the major investor involved. The RRT has recently been incorporated into major new mining agreements in Tanzania and several other developing countries, and its application in general form to the petroleum and mining industries is under discussion in Australia.21

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The IRR is nothing but a measure of return on capital employed and may be computed simplistically by taking the ratio of tax on the average book value of the net capital assets employed.

21. Mention may be made here of a variant of RRT, called “Brown tax” (BT) proposed and named after Cary Brown (see Brown, E.C., “Business income tax-
In countries where RRT exists, it is imposed as a supplement to the general corporate profit tax. Here an issue that arises is whether RRT should be imposed before or after a company profit tax. If RRT is imposed before corporate income tax then it can be treated as a deductible cost. On the other hand, if RRT is levied after the corporate profit tax, the payment of corporate profit tax can be treated as a cash-outflow for the purpose of assessing the RRT.

B. Import duties on equipment used in mineral sector

Import duties are an element of the general tax powers of government rather than an instrument to secure a return on mineral ownership. Thus, as a rule, the tariffs applied to the mineral ores are those generally applicable in the economy. However, in most countries, equipment imports are exempt as mineral sector companies rely heavily on imported capital equipment and intermediate inputs for their exploration, development, and operational activities.

In Argentina, there is no import duty on equipment imports by the mineral companies. In Australia, most plant and equipment imports are subject to a rate of 5%. An exemption is available if and only if there are no substitutable goods in Australia. In Canada and Brazil, most mining equipment is exempt. In China, mining equipment may be exempted for Sino-foreign joint ventures and Sino-foreign cooperatives. In Ethiopia equipment imports are free from import duties. In Indonesia import duty on foreign equipment is exempt for the first ten years and then capital equipment and spares are taxed at around 20%. In South Africa there is no import duty on plant and equipment imports. The countries that levy import duties on mining equipment imports include Chile (10% – exemption for exportable goods), Kazakhstan, Mexico (11%) and Peru (20%).

C. Sales taxes

In countries such as India, minerals are subject to an ad valorem sales tax at the first transaction point, if not at other subsequent points. This is akin to an ad valorem royalty rate and similar to product sharing. The sales tax and similar indirect levies like excise and royalty adversely affect the price of the product. In a competitive environment, this may affect the development of a particular ore. They deter development of the mine by adding to production costs, increase the risk, and can discourage investment. In a way, they also encourage “high grading” and lower grade ore is left in the ground, which will shorten the overall life of a mine with a consequent shortened period of revenue flow to the host country.

Most countries abstain from levying sales taxes not only on mineral ores but also on the inputs and equipment used in the mining. In Argentina, Indonesia, Kazakhstan, Chile, Papua New Guinea, Mexico and Brazil, local purchases of mineral ore are not taxed. In Australia, inputs used on the mine site are exempt from sales tax. In Canada, local purchases of equipment used in mines are exempt while sales of ores attract a provincial tax of 7% to 10%. The Ethiopian sales tax system is similar to that in India, in the sense that mineral ores qualify for a 100% input tax credit while equipment used in mines is not exempt.

However, several countries levy a value added tax (VAT). Even so, VAT on equipment used in mining gets full refund. It is also fairly common to zero rate the mineral ores under VAT.

D. Stamp duty/tax

In the mineral sector, stamp duty is applicable for mining leases or property transfers. The rates of tax vary not only across countries but also within a country across provinces. In some of the countries, the tax is charged at nominal rate of about 1%, for example in Argentina, China, Ethiopia and South Africa. There is an exemption in Brazil, Canada, and the United States and no stamp duty in Chile or Mexico.

E. Property tax

Property tax is another important levy on land and properties charged by local governments. The rates vary widely among the sample countries. It is 1% in Argentina, 1.2% in China on improved property and 1.5% on land and at varying rates in the United States.

IV. TYPES OF MINERAL LEVIES AROUND THE WORLD – NON-TAXES

A. Fixed fee

Fixed fee is generally charged for land use for mining purposes. It is two types: Reconnaissance or prospecting fee which is charged for exploration, and mining lease or licence fee charged for mineral extraction.

1. Land-use fee during prospecting: reconnaissance and prospecting licence fee

In Australia, the charges under this fee are more for gold mines rather than other mineral mines. In Brazil, the rates are negotiable and in case of no settlement, the courts have to decide the rates. In Canada, it is a one-time fee integrated with the mining lease fee. In Chile, a legal fee upon the request for concession and an annual licence fee are paid, based on the number of hectares. In Indonesia, this fee is charged for five years on a progressive rate schedule. Kazakhstan levies this fee based on quality of land, which

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is graded into 11 categories and the rates vary in the range of 25 to 3,000 tenge. However, the rates may be negotiated. In Mexico, mining concessionaires who explore or exploit minerals are subject to a mining duty payable every semester on each hectare or portion thereof included in the concession. The amount of the duty is an amount of Mexican currency which varies with the type of concession (exploration or exploitation) and the period involved.

2. Land-use fee during mining lease: mineral licence fees and lease fee

This fee is charged after successful prospecting of the mining area. In Australia, the rate differs for general-purpose licence or miscellaneous licence and retention licence. In some countries such as Chile, there is an annual licence fee based on the number of hectares, in addition to the legal fee paid on request for concession. In Kazakhstan and Mexico, the charges are the same as prospecting fee charges. Ethiopia differentiates between small and large scale mines. In Indonesia, it is charged as surface deposit and other deposits. There is no fixed fee of either type in Argentina, Brazil or South Africa.

Mineral licences or mining rights may be sold by charging a fixed sum of money independently of whether there is any investment at all. A fixed fee is the most appropriate when the government has little idea of the value of the mineral to be extracted and it is hard to pre-assess it. Thus, it may be suitable for the sale of exploration (as distinct from extraction) rights and for small-scale unorganized mining activity. Sometimes, mining rights are auctioned as in the case of offshore mining in the United States. Auctioning leads the investor to set his own value on the resource, and it charges him an amount equal to that value. However, where the knowledge regarding the total deposits is deficient, as in the case of metal mining, the amount charged by way of fixed fee has little relation to the true rent of a project. The fixed fee system is of course easy to administer, but requires detailed knowledge of the individual project and its prospects.

B. Royalties

Royalties in the form of specific or ad valorem duties on the amount or value of the product are among the most popular additional mining levies. They are commonly used as an element in the fiscal control in most petroleum and mining industries, all over the world. The attractiveness of royalty levies is their simplicity in administration. In the case of specific duty, the base of the tax is the quantity produced, which is easy to check. In the case of ad valorem duty when the true market price is not known, some formula can be prescribed for determining value for tax purposes from quantity produced. Royalties have less deterrent effects on projects actually undertaken than a general fixed fee of the same expected revenue. However, a royalty levy has a distorting effect in the sense that it raises the unit costs of extraction and thereby tends to reduce the pace and extent of extraction (the “high-grading” effect). The result is that some deposits are left in the ground although their price exceeds the total social cost of extracting them. This is socially wasteful as capital investment and disbursements are made without full use of their productive capacity.

It is suggested that a method of avoiding the distorting effects of a royalty is to apply it on a sliding scale. In an extreme version, the royalty might disappear after a certain number of years. If the timing of the sliding-scale royalty is exactly right, it will avoid much of the distorting effect on recurrent extraction decisions, but it may lead to delays in extraction as a means of tax avoidance.

C. Product sharing (PS)

Product sharing between the government and the mineral investor has a certain intuitive appeal, and some governments have adopted it. There are a variety of possible forms and twists that can be given to this device. In its simplest form, it consists of paying for the mineral extracted with a certain fixed proportional share of the output, which the government can then sell. In another type of production-sharing arrangement, the government share production after the investors have recovered the original exploration costs, development costs, and operating costs including depreciation. A production-sharing agreement along these lines is essentially equivalent to the government having a carried interest, and thus is less risky than a working interest, which requires the government to purchase its equity. In this form, PS has similar financial effects to a higher income tax. Currently this is a form approximated in Indonesia.

PS has the same effect as an ad valorem royalty or first point sales tax. A high proportion of PS is like a duty at a very high rate and has very large distorting effects on extraction and leads to “high-grading”. Product sharing can also be viewed as another form of government equity. In theory, the government and the private investors are partners. The government contributes capital to the project in the form of the ore body while private investors contribute the exploration and development costs and operates the project. The government and the private investors agree to share production from the project, though the government often can require the private investors to market its share of the product. Some production-sharing agreements limit the cost recovery in any single year to 30% or 40% of production.

D. Equity sharing (ES)

In some countries, governments insist on the acquisition of equity in a project without paying what could be considered a fair market price. In this sense, it imposes a cost on the investor that is similar in its fiscal effect to some additional taxation. Equity to the government could be substituted for tax rights. Equity holding has an appeal for some governments because of the impression it gives of owner-
ship and control. Government equity in mineral projects is an important political symbol in many countries. Government equity gives a sense of participating in the development of the country. However, there is a case for the government not taking an equity interest in mineral projects. Nevertheless, if at all the government decides to take an equity position in mineral projects, it should use a carried interest.

There are a number of costs associated with public ownership. First, when the government takes an ownership position, it exposes itself to risk. Second, taxation is more likely to maximize government revenue flow than an equity interest that looks to dividends that may never be paid. Third, equity requires the government to divert funds that otherwise could finance priority development projects. If the government borrows externally to pay for its equity interest, there will be years when the government is required to pay interest on its indebtedness even though it received no dividends from its investment. Fourth, there can be a conflict between the government’s role as a shareholder and its role as a regulator. As a shareholder, the government will want to maximize its return from its investment. As a regulator, the government will want to ensure that the mining project fully complies with all government regulations.

1. Carried interest (CI)
This term is used for arrangements in which the state uses its revenue to acquire (compulsorily) equity in the project. The revenue may be converted into equity as it accrues, or equity may be acquired in advance through a loan from the company, which can be repaid using the profit share accruing to the government. This form is used in Zambia under the copper nationalization of 1970, in Papua New Guinea under various petroleum agreements, and in a uranium mining agreement in Tanzania. Carried interest has implications for the timing of the company’s after-tax cashflows. The liquidity position of the company would be better if, in lieu of taxes, the government is allowed to acquire equity.

V. CONCLUSION
The above analysis shows that mineral sector activities attract several taxes in highly diversified forms and the levy systems vary widely in the world. In each country, there exists a gamut of levies, each with a plethora of components impinging on the mineral sector at various stages of prospecting, exploration, trade and final consumption.

Broadly, three traits can be observed in the mineral tax practices. Firstly, most countries tend to have sector-specific levies for the mineral sector. This is understandable in view of the special character of mineral sector investment and operations. The high risk, high capital-intensity characteristics of the mining activity coupled with long gestation lags involved in prospecting and extraction call for special tax treatment of the sector.

One broad trend that emerges is the overwhelming dependence on income taxation. In fact, the income tax system is the most-used instrument for regulating the mineral activities and for revenue generation for the government. The only other levy worth mentioning is the royalties.

As international capital flows are guided by the prevailing fiscal regimes, it is important to know the scope for their harmonization across the countries. However, it is very difficult to make intercountry comparisons of the mineral tax regimes in terms of structure and impact. The two most important factors responsible for the diversity in the mineral levy regimes across the countries could be: (a) the composition of the minerals, (b) the nature and degree of decentralized governance, and (c) the level of economic development.

As regards the first factor, although most levies are ad valorem, the wide diversity in the composition of the mineral results in even wider diversity in terms of the value of the tax bases that may require a country-specific system for optimizing the revenues. For example, the mineral sector in South Africa is dominated in value terms by the gold and diamond mines. Accordingly, specific mineral levies are designed to optimize the revenues from gold and diamond mines. While the basic income tax rate is 35% for other mines, gold mining income is taxed on a formula basis, in terms of which the tax rate rises with an increase in the ratio of profit to sales revenue. For gold mines, a depletion allowance is built into the formula. This is quite in contrast to the Indian system where the mineral sector is hardly given special tax treatment.

Next regarding the decentralization of governance, the sharing of the tax powers instead of tax revenues between the national and sub-national governments results in diversified levy systems. This is especially true for countries that have adopted a federal form. In our sample, as many as 9 out of 15 countries have a federal form of government. Even among these federal countries, the degree of decentralization varies and so does the sharing of taxing power. For example, in India, income taxes are leviable only by the Central Government and states are allowed only the trade-related taxes such as sales tax and royalties. Naturally, the States in India are not willing to forego the sales tax even though sales tax on minerals is rare worldwide.

Finally, the sample countries differ in terms of the level of economic development and it is well known that the tax systems differ between the developed and developing countries. In view of these factors, harmonization of mineral levies across the countries is a distant possibility.

24. There are two formulae, the first applying where the gold mine has elected to be exempted from Secondary Tax on Companies (STC) and the second applying to all other gold mines. The formula takes the form of $y = a - ab/x$, where: $y$ = the tax rate to be determined, $x$ = the ratio of profit to revenue (as a percentage), $a$ = the marginal tax rate, $b$ = the quantum of revenue that is free of tax (calculated as a percentage of revenue); note, this is a form of depletion allowance. The first formula is: $y = 51 - 255/x$ (where $a = 51$ and $b = 5$), and the second is $y = 43 - 215/x$ (where $a = 43$ and $b = 5$). All companies (with the exception of gold mines subject to the first formula) must deduct STC on dividends paid by them. The flat tax rate is currently 35% and the STC rate is currently 12.5%. For companies subject to the flat tax rate of 35%, this results in an effective tax rate of 42.22% on distributed earnings (computed as $35 + 12.5/112.5$ of the remaining 65%).