The Tax Treatment of the Mining Sector: An IMF Perspective

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This session of the workshop addresses the question of whether the development of the mining sector requires a sector specific taxation regime. The simple answer is “Yes.”

The government, as resource owner, has a valuable asset in the ground. This asset—a mineral deposit—can only be exploited once. In order to convert this asset into financial resources the government must attract capital on terms that ensure it gets the greatest possible value for its resources—under uncertainty about what the value of the resources will turn out to be.

There is a fundamental conflict between mining companies and governments over the division of risk and reward of mineral development. Both want to maximize rewards and shift as much risk as possible to the other party. Nevertheless, the right choice of fiscal regime can improve the trade-off between each party’s interests—a small sacrifice from one side may be a big gain for the other. Mining agreements and the associated fiscal rules are a means of creating an identity of interest between the mining companies and the government. They establish the “price” of the resource in terms of the bonuses, royalties, taxes or other payments the investor will make to the government over the life of the project. Designing fiscal arrangements that encourage a stable fiscal environment and efficient resource development maximizes the magnitude of the revenues to be divided.

Given multiple objectives, multiple fiscal instruments may be needed to protect the interest of the government and the mineral companies over the life of the agreements. Product-based instruments, such as royalties, can ensure the government receives at least a minimum payment for its mineral resources. Profit-based instruments allow the government to share in the upside of highly profitable projects, but they also increase the government’s share in the project’s risk inasmuch as the government may receive no revenue if the project turns out to be unprofitable.

1 Background paper prepared for the World Bank workshop on the taxation of the mining sector, April 4-5, 2001. Emil Sunley, Assistant Director, and Thomas Baunsgaard, Economist, are both in the Fiscal Affairs Department of the International Monetary Fund. The authors wish to thank Philip Daniel and Howell Zee for their comments on an earlier draft.

2 At the most general level, the issues relating to the tax treatment of the mining sector and the petroleum sector are congruent. In one case the valuable asset is solid while in the other case it is a liquid or a gas. In both cases, the government has a valuable asset in the ground that can only be exploited once (see the annex on differences between mining, oil and gas taxation).
In addition to product-based and profit-based instruments, there may be bonuses of various types. While bonuses can ensure some up-front revenue for the government and may encourage companies to explore and develop contract areas rapidly, they are usually feasible only in highly prospective areas where there is strong competition among investors for mineral rights.

In many countries with mineral resources, revenues from different instruments accrue to different parties; for example, local units of government or the Ministry of Mining may accrue a share of royalty payments.

Mineral resources may be developed under tax/royalty regimes or under production sharing contracts (PSCs). In the case of hard minerals, production sharing is rare, and we return to that later.

A. Tax/Royalty Regimes

A tax/royalty regime may involve three levies: (1) a royalty to secure a minimum payment, (2) the regular income tax that is applicable to all companies, and (3) a resource rent tax to capture a larger share of the most profitable projects.

Royalties

Royalties are either specific levies (based on volume of minerals extracted) or ad valorem levies (based on the value of minerals extracted). They secure revenue for the government as soon as production commences, are considerably easier to administer than most other fiscal instruments, and ensure that companies make a minimum payment for the minerals they extract.³

Royalties raise the marginal cost of extracting minerals, as they are based on the volume or value of production. A royalty set too high may discourage development of marginal deposits and lead to early closure of productive mines. Nevertheless, a regular minimum payment is usually necessary to justify extraction of the resource in the public mind, to assure stability of the fiscal regime, and to broaden the tax base.

Investors are resistant to the use of substantial royalties, even on potentially rich deposits, on the grounds that a royalty is a deductible rather than a creditable item for tax purposes in the home jurisdictions of investing companies.

Ad valorem royalties are generally levied on the sales price or the f.o.b. export price. An overriding concern should be the use of an observable price, and (in the case of many minerals) this could necessitate using a downstream price. If a downstream price is used, either the rate of the royalty should be adjusted to reflect the transportation and other costs embedded in the downstream price, or the extracted value should be established by netting back the transportation and other costs.

While most countries apply royalties in order to secure a stream of revenue up-front, the actual rates vary widely. The rates chosen will reflect the interaction with other taxes imposed on the mining operation (e.g., a high royalty rate may be offset by a low income tax rate), and higher rates may also be assessed on more valuable minerals.

**Income Tax**

The income tax should be levied on mining and non-mining companies. The base of the income tax—taxable profits—requires a matching of income with the expenses necessary to produce that income. Many countries provide an incentive for mineral exploration and development by allowing exploration costs to be recovered immediately and allowing accelerated recovery of development costs, for example, over five years. Accelerated cost recovery brings forward payback for the investor and, possibly, retirement of debt. It can therefore reduce both investor risk and tax-deductible interest costs; it can also assist the financing of projects. Some countries also offer special incentives to encourage small-scale mining activities or exploration in particular regions.

To protect the tax base, countries may place limits on the use of debt financing to limit “earning stripping” through the payment of interest abroad. There is also the possibility of abusive transfer pricing between related companies. The tax authority should have the power to adjust income and expenses where under- or overpricing between related companies has resulted in a lowering of taxable profit (see Box 1 for examples of transfer pricing).

It is not unusual for the profit tax rate for mineral (and petroleum) companies to be higher than the general rate for other companies. This is one way to capture a share of the resource rents from the project but a more robust alternative may be a resource rent tax. A higher rate may also be warranted if a dividend withholding tax is not imposed.\(^4\)

Many multinational companies expect to be subject to an income tax as this tax will be creditable against the income tax levied in the home country. Absent an income tax in the producing country, the multinational would be subject to higher tax payments in the home country (unless foreign sourced income is exempt in the home country). Whether or not a tax is creditable depends on the particular tax law in the home country and on any bilateral tax

\(^4\) This is the case, for example, in Papua New Guinea, where dividend withholding tax does not apply to petroleum companies; a higher rate of basic corporate tax is applied instead.
### Box 1. Transfer Pricing

A multinational mining firm will typically have tax liabilities in both its home country and host country. This provides fertile ground for attempts at minimizing the overall tax liability through transfer pricing and other means of tax avoidance by seeking to minimize income and maximize deductible expenditures in high-tax jurisdictions and vice versa in low-tax jurisdictions.

Some transfer pricing mechanisms that affect revenues are:

- The sale of export proceeds at below-market prices to an affiliated company located in a low-tax jurisdictions.
- The creative use of price hedging mechanisms perhaps involving transactions between related parties.

Measures to maximize expenditure deductions include:

- The provision by related parties of debt finance at above-market interest rates perhaps leading to highly leveraged projects.
- Claiming excessive management fees, deductions for head-quarter costs, or consultancy charges paid to related parties.
- The provision of capital goods and machinery in leasing arrangements with above-market leasing costs charged by a related-party lessor.
- If the mining tax rate is above the standard corporate income tax, there may be an incentive to establish a domestic shell firm that will on-lend finance from related parties to the mining firm giving rise to an interest deduction that may be applicable at a higher tax rate than is charged on the interest earnings in the shell company.

The tax legislation should include safeguards requiring that transactions between related parties will be assessed on an arms-length basis. Some countries also (for tax purposes) impose a cap on the allowable debt-leverage of a project. However, for some specialized goods and services it can be difficult to determine what exactly is a fair market price. There is often also a case of asymmetric information between the tax administration and the taxpayer in this regard. One way to overcome this is to seek cooperation with the tax authorities in the home countries of the mining companies.

treaties in place. However, a tax paid in the producing country that in nature resembles a home country tax is most likely to qualify for a tax credit. Some specialized mining taxes, such as a resource rent tax, may be deemed to differ in nature from a standard corporate tax and, therefore, could face difficulties in qualifying for a tax credit.

It is important to determine the extent of “ring-fencing” of tax accounts. Ring fencing means a limitation on consolidation of income and deductions for tax purposes across different
activities, or different projects, undertaken by the same taxpayer. Some countries ring-fence mining (and petroleum) activities, others ring-fence individual contract areas or projects. This can become complex if a project incorporates extraction, processing and transportation activities. If the mining tax regime is more onerous than the standard tax regime, the taxpayer will seek to have these project related activities treated as down-stream activities outside the ring fence. If they are treated as a separate activity, the taxpayer through abusive transfer pricing may shift profits to the lightly taxed downstream activities.

Ring-fencing rules matter for two main reasons:

- Absence of ring-fencing can seriously postpone government tax revenue because an investor who undertakes a series of projects will be able to deduct exploration or development expenditures from each new project against the income of projects that are already generating taxable income.

- As a mining (or petroleum) area matures, absence of ring fencing may discriminate against new investors who have no income against which to deduct exploration or development expenditures.

Despite these points a very restrictive ring-fence is not necessarily in the government’s interest. More exploration and development may occur if taxpayers can obtain a deduction against current income, generating more government revenue over time by increasing the taxable base. The right choice is a matter of balance within the fiscal regime and the degree of government’s preference for (modest) early revenues over (greater) revenues later on.

**Resource Rent Tax (RRT)**

A RRT (such as is applied for example in Australia, Ghana and Papua New Guinea) is imposed only if the accumulated cash flow from the project is positive. The net negative cash flow (in the early years) is accumulated at an interest rate that, in theory, is equal to the company’s opportunity cost of capital[^5] (adjusted for risk) or discount rate. The RRT takes a share of returns once the company has earned this hurdle rate of return. If the only tax imposed is a RRT, the government’s revenue stream becomes back-loaded, and for less profitable projects, the government may not receive any revenue at all. Therefore, a resource rent tax is usually combined with royalties and a standard profit tax to provide some early revenue. Only for very profitable projects will the resource rent tax then apply.

Properly designed, a RRT captures a share of natural resource rent, which is the return over and above the company’s opportunity cost of capital. The RRT may enhance contract stability because it automatically provides additional revenue in highly profitable projects.

[^5]: The “opportunity cost of capital” means the expected return on the best alternative use of available funds.
For the RRT to be efficient, each contract area needs to be ring-fenced. That is, costs incurred in one contract area cannot be used to offset the revenues in another contract area. One exception to this rule may be to allow unrecovered costs from an abandoned contract area to carryover to a contract area that remains active. This helps to prevent an RRT from discriminating against exploration.

While the resource rent tax has much theoretical appeal, it has not been a significant revenue raiser in practice. There may be many reasons for this. It could reflect the difficulty of designing the tax, particularly the choice of the discount rate and tax rate. If these are set too high, chances are that the resource rent tax will never apply; if they are set too low, the tax may become a major deterrent to investment. If the threshold rate of return or the tax rate are significantly misspecified the RRT may also increase the incentives for mining firms to engage in tax avoidance, which in countries with a weak tax administration may be very difficult to detect. Finally, it may simply reflect the relatively lower profitability of mining projects—if that is so, then the tax may have worked appropriately in the countries which have used it, since it will have deterred fewer investments than alternative tax devices.

B. Production Sharing

Production-sharing arrangements are far less common for hard minerals than for petroleum, except (possibly) in the countries of the former Soviet Union. Nevertheless, there is no a priori reason not to use production-sharing in the mining sector.

Under production sharing the government retains the right to mineral resources in the ground but appoints the investor as “contractor” to assist the government in developing the resources. Instead of paying the contractor a fee for this service, while the government bears the risk, cost and expense, the parties agree that the contractor will meet the exploration and development costs in return for a share of any production that may result. The contractor will have no right to be paid in the event that discovery and development does not occur. In principle, the government retains and disposes of its own share of minerals produced (though joint-marketing arrangements may be made with the contractor).

The PSC will usually specify a portion of total minerals, which can be retained by the contractor to recover costs ("cost minerals"). The remaining minerals (including any surplus of cost minerals over the amount needed for cost recovery) are termed “profit minerals” and are divided between the government and the contractor according to some formula set out in the PSC.

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6 Although in this respect the RRT is probably less distortionary than the regular corporate income tax, since normal CIT postpones the achievement of a desired rate of return (particularly if slow depreciation rates are specified) and therefore encourages other behavior likely to increase current deductions.
Production sharing is a very flexible fiscal instrument. In some production sharing contracts there is an explicit royalty payment that is paid to the government before the remaining production is split between cost and profit minerals. An alternative to a royalty is to have a limit on cost minerals, for example, 60 percent of production, which ensures there is profit minerals, and therefore government revenue, as soon as production commences.

Unrecovered costs in any year are carried forward to subsequent years. Some PSCs allow unrecovered costs to be uplifted by an interest factor to compensate for the delay in cost recovery. Interest expense is generally not a recoverable cost. If interest expense is allowed to be recovered, then there should be no uplift for unrecovered costs as this would involve a double counting to the extent unrecovered costs are debt financed.

The split of profit minerals is often fixed. However, the split of profit minerals may vary by level of production during the year, the cumulative production in the contract area, the price of the minerals, or the internal rate of return earned on the project.

Contractors usually pay income tax on their share of production. This tax could be paid out of the government’s share, but then the government’s share should be increased, all other things equal. A significant advantage of this approach is that the contractors would have fiscal stability—any future changes in the tax rules would affect only the allocation of the government’s share between tax and non-tax minerals. The assurance of fiscal stability is an important investment incentive, carrying the cost of reduced flexibility for the government to increase tax on a given project in future (see Box 2 on explicit fiscal stability clauses).

C. The Choice between Tax/Royalty and Production Sharing Regimes

There is no intrinsic reason to prefer a tax/royalty regime to a PSC regime. The fiscal terms of a tax/royalty regime can be replicated in a PSC regime, and vice versa (Table 1). For example, the PSC may have an explicit royalty, or there may be a limit on cost minerals that functions as an implicit royalty. In a PSC regime, the contractor can be subject to the same income tax as other companies. The split of profit minerals can mimic a resource rent tax. This is especially true if unrecovered costs are uplifted by an interest factor that approximates the contractor’s opportunity cost of capital or discount rate. In such cases, there would be no profit minerals to be split, other than the profit minerals representing the implicit royalty, until the project has earned the hurdle rate of return.

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7 If the tax is paid out of the government share, the tax can qualify for the US foreign tax credit (Regulation 1.9001(f)(2)). For this to work, the tax would have to be an income tax, and the amount of tax could not exceed the government’s share.
Box 2. Fiscal Stability Clauses

Given the nature of mining investments—long term and large-scale—a particular concern for investors is to guard themselves against changes to the financial premises of the project. One risk is unexpected tax policy changes, and investors often seek to minimize this by the inclusion of a fiscal stability clause in the project agreement. While this can seem to the government as an attractive and, in the short run, inexpensive way of minimizing investor risk, it may have a quite negative impact by limiting the government’s flexibility to set tax policy in the future. This can be further exacerbated if the practice spreads to other sectors in the economy.

Fiscal stability clauses can take many forms. One approach is to essentially “freeze” the tax system at the time of the project agreement. However, if the tax system is later changed, this will imply special treatment of individual taxpayers—the cost of such special treatment needs to be weighed against the investment that may have been induced. Another approach is to guarantee the total investor take: If one tax is increased, this will be offset by a reduction in another tax (or in principle by paying a compensatory subsidy). This perhaps preserves better the integrity of the tax system. Still, it may be quite difficult in practice to agree on compensatory measures that can satisfy both government and investor. There are also some, seemingly unfair, asymmetric stability clauses, protecting the investor from adverse changes to the fiscal terms but passing on benefits of economy-wide reductions in tax rates. Finally, under production sharing, fiscal stability may be achieved by having the tax paid out of the government’s share.

Table 1. Comparison of Tax/Royalty and PSC Regimes

<table>
<thead>
<tr>
<th>Risk/Reward Trade-off</th>
<th>Tax/Royalty Regime</th>
<th>Production Sharing</th>
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<tbody>
<tr>
<td>Low risk to government</td>
<td>Royalty</td>
<td>There may be an explicit royalty; or there may be a limit on cost minerals that functions as an implicit royalty</td>
</tr>
<tr>
<td>Medium risk</td>
<td>Income tax</td>
<td>Income tax, which may be paid out of the government’s share of production</td>
</tr>
<tr>
<td>High risk</td>
<td>Resource Rent Tax</td>
<td>The determination of the amount of profit minerals can mimic a resource rent tax</td>
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From the perspective of the multinational mining companies, the primary concern is how attractive are the mining prospects, how the fiscal terms affect their risk, and what is the expected reward if minerals are found. PSCs permit the conditions governing mineral exploration and development to be consolidated in one document. This can sometimes assist the attraction of investment. They are particularly helpful to newcomers, not familiar with the operating environment, since the necessary provisions (including fiscal stabilization) may be consolidated in the PSC and the way in which law will be applied may be clarified. The PSC
is a straightforward way in which *contractual* assurances, additional to statutory rights, can be offered to investors.

Production sharing has been little used in the hard mineral sector, though it is very common in the petroleum sector. One reason might be that there is not much to share relative to crude oil and that there is no demand on the domestic market for some of the minerals. Thus, governments look either to get cash up front in royalties or capture some value added in downstream processing.

Crude oil can be transported in near natural form and has a high value as an input relative to the total value of the final output. That is not the case for most hard minerals. Sharing may not make sense for the extraction of hard minerals until there is something approaching final output—post-smelter, but then it is not production sharing but output sharing. The return to hard mineral extraction, while competitive, is not large (relatively speaking), making a profit share less attractive.

### D. State Equity

A government may also participate more directly in a mining project by taking an equity share. Equity participation can take several forms, including: (i) paid-up equity on commercial terms, which places the government on a similar footing as a private investor; (ii) paid-up equity on concessional terms, where the government acquires its equity share at a below-market price; (iii) a carried interest, where the government pays for its equity share out of production proceeds, including an interest charge; (iv) tax swapped for equity, where the government’s equity share is offset against a reduced tax liability; (v) equity in exchange for a non-cash contribution, for example by the government providing infrastructure facilities; and (vi) so-called “free” equity, which is a bit misleading since even the non-cash provision of equity usually results in some, more or less transparent, off-setting reduction in other taxes.

Equity participation is mainly motivated by a desire to share in any upside of a project, but is often also driven by non-economic reasons. These can relate to nationalistic sentiment, to facilitate transfer of technology and know-how, or to provide more direct control over project development. However, equity participation often becomes a costly option when consideration is taken into account of the cash-calls arising from equity participation. There are also possible conflicts of interest arising from the government’s role as regulator overseeing the environmental or social impact of a project, which may differ from its objectives as an equity shareholder. In many instances, the government is therefore better off by focusing on taxing and regulating a project rather than being directly involved as an equity participant. It should also be kept in mind that the economic impact of an equity share can in principle be replicated by tax instruments. For example, a carried interest is equivalent to a resource rent tax with the equity share equal to the tax rate and the interest rate on the carry equal to the threshold discount rate.
E. Indirect Taxes

In principle, mineral projects should be treated similarly to other economic activities when it comes to indirect taxation. In practice, however, the mining sector in many countries is treated differently either due to its special nature or as a fiscal incentive to attract investors.

Import duties

If there were no special treatment for import duties, these would be an attractive way for the government to secure an up-front revenue stream. Given the very substantial import needs, particularly during project development, this revenue is typically even more front-loaded than royalty payments. For the same reason, duty exemptions are highly attractive to investors. Duty exemptions can also be sought as a way to minimize dealings with customs officials, where foreign enterprises with substantial import needs can be an easy target for rent-seeking behavior.

It is quite common that specialized equipment for exploration and development is exempted from import duties. At times, this exemption only applies if the equipment is re-exported after its use, or in some instances if ownership of the equipment is transferred to a state-owned company. At other times, all inputs (perhaps restricted to purchases that are not available locally) receive a blanket exemption. Some countries provide guarantees against discriminatory duties being imposed on mining companies, for example by applying a maximum allowable duty. This can result in reverse discrimination whereby duties on imports for mineral projects are in effect lower than for other importers.

Value added tax

A mining project in a developing country will typically export most, if not all, of its output. Combined with the very large investment needs, this can complicate the treatment for VAT purposes. If exports are zero-rated under the VAT regime, the mining firm will likely be in a net refund situation seeking to reclaim VAT paid on investment goods or on inputs. While this in an economic sense is the correct treatment of an exporter as long as the VAT is applied on a destination basis, it may constitute a challenge for a weak administration, which can face problems paying refunds in a timely fashion. This situation is further exacerbated by the magnitude of the VAT refunds, particularly during the investment period.

In response to this situation, special treatment is often sought by the mining firms, and frequently granted by the government. A common solution is to zero-rate exports but to exempt from VAT imported capital goods and sometimes imported inputs. At times, this treatment is also sought for domestic suppliers to projects. This extension can be particularly problematic, though, since it opens a loophole for domestic firms to evade VAT payments by claiming that goods and services have been supplied to mining operations. That said, if the capacity is not in place to administer a refund based system, and some relief is required, it might be a second-best option to restrict the exemption to capital goods and perhaps to
certain specialized mining inputs. It is important that the exemption does not apply to inputs that can be generally used by other sectors in the economy since this will open another loophole for tax evasion. If imports of goods that are also produced locally are exempted, this will be an incentive for firms to purchase directly from foreign suppliers rather than from local producers.

F. IMF Perspective

We would suggest that up to this point, we would find broad agreement with what we have said about the fiscal regime for the mining sector. There may, however, be some differences in emphasis. Some may favor greater reliance on production-based levies to ensure the government gets a steady stream of revenue. Others would put greater emphasis on profit-based levies to minimize distortions. But the differences are not black and white but instead different shades of gray. At the end of the day, the fiscal terms offered by a country are likely to be an outcome of a bargaining game reflecting negotiating strength and experience, size and quality of mineral reserves in a country, and the track record of previous projects. During negotiations, fiscal revenue may be given up to compensate for particular high costs of extracting minerals.\(^8\) However, there is a growing concern that the government share of economic rent may become excessively low as countries compete against each other in attracting mineral projects; particularly if the fiscal regime is used excessively in an attempt to compensate for an otherwise unattractive investment environment or high political risk. While the pressure to provide generous fiscal terms to attract an investor can seem substantial, there is also an option value of saving the nonrenewable resource for later development.

The Fund comes at the taxation of the mineral sector primarily from the tax side; the World Bank has a critical mass of expertise on the mineral sector. In terms of technical assistance to member countries, the Fiscal Affairs Department has fielded only limited number of mining sector tax missions, whereas more missions have addressed petroleum and gas taxation issues.\(^9\)

Let us now briefly outline some issues where the IMF may come out differently than development banks.

1. If this workshop had been held 15 or 20 years ago, there would be a difference between the Bank and the Fund over the role of state-owned mining companies. The Fund has long

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\(^{8}\) For example, if the investor will need to provide infrastructure services in the vicinity of a project site, to offset high transport costs to markets, to compensate landowners, or for security related costs.

\(^{9}\) We were able to identify only four mining sector tax missions in the last 15 years.
championed privatization of state-owned companies. Twenty years ago the Bank provided project finance to state-owned mining companies (and to private sector mining companies). World Bank loans to finance mineral projects are rare today.

2. While the Fund is equally concerned about the short-term fiscal situation and the medium-term fiscal sustainability of member countries that are implementing policies supported under a program, fiscal consolidation, which is usually needed, often requires that spending be reduced or revenues increased. Otherwise, the country may be forced to finance budget deficits by printing money, which fuels inflation. Under these circumstances, the Fund is usually quite wary of fiscal arrangements that produce little near-term revenue but hold out the promise of major revenue flows in the medium term.

This may reflect a more fundamental tension within a country where the mining ministry and the ministry of finance—with the latter being the Fund’s traditional counterpart—may have quite opposing views on what constitute a fair tax on the mining sector. The finance ministry will often be quite focused on improving current revenue collections and minimizing any revenue loss, whereas the mining ministry will be more attentive to the need to offer attractive fiscal terms (meaning lower taxes) to attract capital for exploration and development. This conflict may even spill over into international development banks.10

3. In many developing countries, the main macroeconomic impact of mineral extraction is likely to be through the fiscal link, particularly where mining projects are operating in an enclave economy.11 Though there is potential for the domestic private sector to supply goods and services to a project, often these structural links are less extensive. While there will be employment generated by a mining operation, at times the skill level and expertise required is not available locally necessitating the use of a large number of expatriate workers. This gives even more prominence to the question of how a government handles the revenue inflow from the mining sector. International experience shows that poor management of mineral revenues can turn a potential blessing into a curse—Nauru being an extreme example. Governments need to address: precautionary savings in case of shortfalls in mineral revenues; generation of income when minerals are depleted; and stabilization of the economy in the face of fluctuations in mineral revenues. In preparation for this, governments should develop a framework for medium- and long-term management of mineral resources.

10 As illustrated by comparing two publications from the 1990s, one advocating the desirability of a mining tax system with “no or minimum royalties”, the other arguing that royalties can be justified as a user cost on the value of extraction or as a second-best instrument given administrative cost, asymmetric information, and other market failure (see “A Mining Strategy for Latin America and the Carribean”, World Bank Technical Paper no. 345, 1996, and “Issues in Evaluating Tax and Payment Arrangements for Publicly Owned Minerals”, by R. Conrad, Z. Shalizi and J. Styme, World Bank PRE Working Paper, August 1990).

11 There will, of course, also be an impact on the balance of payments.
A recent Fund study\textsuperscript{12} of nonrenewable resource funds (NRFs) concluded:

- The econometric evidence suggests that for countries with NRFs, the establishment of a fund did not have an identifiable impact on government spending.

- This may suggest that countries with more prudent expenditure policies tended to establish an NRF, rather than the NRF itself leading to increased expenditure restraint. The establishment of a fund may have helped maintain cautious policies in the context of ongoing revenue variability. It could also reflect the spill-over of fiscal problems to the NRF in countries with weak public expenditure management practice.

- Country experience suggests that the behavior of prices and the issue of fungibility pose substantial problems for the operation of the NRFs. Moreover, there is evidence that funds may have been most difficult to operate when the extent of reliance on resource revenues has been largest.

\textsuperscript{12} This study surveyed both petroleum and non-petroleum funds including Chile’s Copper Stabilization Fund and Papua New Guinea’s Mineral Resources Stabilization Fund. The study should come out in the Fund’s Occasional Paper series in 2001.
Annex: Oil, Gas and Mining Tax Regimes

Mineral extraction can apply to both hydrocarbons (such as oil, condensate, and gas) and scarce hard-rock minerals (such as copper, silver, and gold; but excluding abundant minerals with little rent such as sand and gravel). There are sufficient similarities in the economics of extraction of these minerals to derive general principles for taxation (e.g., the generation of economic rent). At the same time, there are sufficient differences between different types of resources that justify different tax treatment, regarding both the total tax burden and tax design. In addition, there will also be differences between individual projects regarding geological size and quality of resource deposits, geographical distance, costs of development, operation and transportation, and risk. At times, this may justify a case-by-case approach when designing the tax regime.

Mining

Mining projects range from small-scale alluvial gold mining to very large-scale projects with substantial macroeconomic impact. Typically, small-scale mining activities are treated differently for tax purposes than large-scale mines. Some countries include small mines within the standard tax regime, with micro-scale mining activities often completely escaping taxation, or only included in the tax net through licensing fees or perhaps some kind of royalty payments.

Oil

Oil projects are often larger than mining projects though some countries have developed relatively small oil projects. Economic rents generated from the extraction of oil has historically been higher than for hard-rock minerals. This partly reflect the ability of major producers (primarily through OPEC) to prevent a sustained fall in prices over time, in contrast to many other minerals. Oil prices have also been fluctuating sharply over recent years, which of course provides for the possibility that even projects with normal profits can experience periods where substantial profits are generated. Typically, the fiscal regime provides a higher state take under oil regimes than under mining regimes to factor in expectations that the extraction is likely to generate higher profits. It is also far more common to see production sharing arrangements in the oil sector compared to the mining sector. This, however, seems partly to be historically based, though it may also reflect relatively lower profitability from mining.

Gas

Gas projects are quite different in nature from other hydrocarbon projects, because of the need to commercialize the gas. Typically, this involves long-term supplier agreements for the produced gas being negotiated prior to project development. The investment required is also often much more substantial particularly for downstream processing facilities (e.g., for an LNG plant), or for transportation facilities (e.g., pipelines or dedicated gas transportation ships). The economic rent generated is typically lower than for oil projects; however, the
magnitude of the investment, the long lifetime of a project and its fiscal impact may at times far outweigh the impact of oil projects. Fiscal regimes for the gas sector are typically negotiated with a large amount of flexibility on a contractual basis to accommodate the characteristics of a particular project. Both profit tax based and production sharing regimes are common in the gas sector.