



# Fiscal systems for mining – the case of Brazil

by Philip Andrews-Speed

**A nation's fiscal system is not just a critical factor in a mining company's assessment of a potential investment, it is also one factor which the host government can change in a relatively short time. For several years Brazil's fiscal regime for mining has been unfavourable and the level of investment has fallen. Recent modest changes to the legal and fiscal regime have resulted in a renewed level of interest from foreign mining companies. Despite this improvement, Brazil's fiscal system has scope for improvement. This paper identifies some of the key issues which could be addressed by Brazil and by other emerging nations which seek to overhaul their protectionist investment regimes to face the challenges of an increasingly competitive world economy.**

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The international mining industry is like a bazaar, or street market. The nation with the mineral resource is the stall-holder and the international mining company is the shopper. Each stall-holder has a range of goods on offer, differing in both the nature of the goods and their quality. Each shopper has their own shopping list, with varying requirements concerning product, price and quality. At the end of the day bargains will have been reached. Most shoppers will have succeeded in purchasing a majority of the items on their list, on more or less satisfactory terms. Satisfaction among the stall holders may be less evenly distributed. A few will have done well. They will be those who stock what is wanted at a fair price, and who have a reputation for quality and fair-dealing. In the middle will be a large segment of merchants who have made a modest profit. Enough to pay the domestic bills but not enough to raise their standard of living. At the bottom end will be those stall-holders who either sold little or had to sell at a loss. Possibly the goods were not in demand or their quality was poor. Alternatively the merchants themselves were unskilled at bargaining or had a bad reputation.

The international mining industry is no different. When a multinational company is considering where to invest, it has a very large number of choices. Almost every country in the world is now open to foreign investment in the natural resources industry. The collapse of the former Soviet Union and the reversal of protectionist policies in many developing countries has completely changed the complexion of the market for investment in the mining sector.

When evaluating a specific country for investment a mining company is likely to focus on three issues.<sup>1</sup>

- geological risk and reward,
- political and macro-economic risk,
- the fiscal system.

The geological resource of a country is given, but the perception of that resource changes as more knowledge is acquired

and as the market fluctuates. Brazil is clearly blessed with a generous endowment of mineral resources. For many minerals Brazil ranks among the top ten countries in the world with respect to both proven reserve and production.<sup>2</sup> The potential for further discoveries is great.

Brazil also ranks highly in the context of political and macro-economic risk. The Economist magazine<sup>3</sup> places Brazil together with Argentina among the most risky countries in the world for investors: less risky than Mexico and Venezuela, but more risky than China and the Philippines. This is not the place to justify this perception. Indeed the perception may be inaccurate. Yet in any market it is the perception of risk that matters, not the reality. The credibility of a government or a nation can be lost overnight, but take years to recover.

Fiscal policy is therefore of critical importance to Brazil, suspended as it is between a favourable geological rating and a poor country-risk rating. Unlike perceptions of geological potential and political risk, a tax regime can be improved in a short time. International mining companies are prepared to invest in "high-risk" countries if the rewards are commensurate with the risks. The problem in Brazil is that this has not been the case in recent years.

A study of international regimes for mining, completed in 1993 by the Canadian government<sup>4</sup> showed that the regime in Brazil was one of the most unfavourable of major mining nations (Table 1). Not only was the effective rate of taxation high, the system was also regressive. That means that enterprises with a low degree of profitability were taxed at a higher rate than more highly profitable enterprises.

In this context it is hardly surprising that the level of foreign investment in Brazil's mining industry has plummeted to a fraction of what it was in the early and middle 1980s. Indeed the amount of domestic private investment in the mining sector has also fallen.<sup>5</sup>

In the last two years efforts have been made to improve Brazil's tax regime for the mining industry.<sup>6</sup> These efforts are to be commended. However a major turnaround in the investment prospects is unlikely without a more profound review of the fiscal policy for private investment in the mining sector.

This paper does not seek to analyse Brazil's present fiscal policy in detail, nor does it try to provide specific recommendations for a new tax regime. Rather, the aim is to highlight a number of issues which should be addressed by any country when designing or redesigning a fiscal package for mining. These will be addressed under the following headings:

- Why is the mining industry special?

- Reconciling the objectives of government and the companies.
- The characteristics of tax regimes.
- Tax allowances in the mining industry.
- Mineral taxation in federal systems.

### Why is the mining industry special?

Brazil has few tax regulations which are specific to the mining industry. This is one of the main reasons why private investment has remained at a low level in recent years. Natural resource industries are different from manufacturing and service industries and require special tax treatment.

The following features distinguish the natural resource sector in general, and the mining industry in particular:

- high risk,
- many failures,
- long time scales,
- the unmovable nature of a deposit,
- high capital intensity, and low labour intensity.
- the non-renewable nature of most natural resources.

These have profound implications for both companies and governments.

The high risk associated with most resource projects, especially at the exploration stage, relates mainly to geological uncertainty. This high risk, combined with the scale of capital required, distinguishes the mining and petroleum sectors from most other industries. The risk is highest at the exploration stage, but is also significant during both development and production. Only when the deposit is exhausted do you know precisely what the reserve was. Add to the geological risk the uncertainties relating to cost and market prices, and it becomes clear why international mining companies are so choosy as to where they invest. Many ventures end in failure and massive losses. These have to be paid for by the successful projects.

The long time scale of mining projects adds to the requirement for mining companies to evaluate the risks carefully. The life of a mine may exceed fifty years, and the period from first systematic exploration to first production is likely to exceed ten years.

In the case of rich or large mineral deposits, the unmovable nature of the resource provides a host government with a certain degree of bargaining power which it would not have in the case of a manufacturing or service industry. A company has no choice but to negotiate with that government if it wants to exploit that specific deposit or mineral province. The company cannot "move"

**Table 1. Effective tax rates for low and high-profitability mines in different fiscal regimes in 1993.**

| Fiscal regime    | Province/State           | Average effective tax rate per cent |                    |
|------------------|--------------------------|-------------------------------------|--------------------|
|                  |                          | Low profitability                   | High profitability |
| Canada           | Quebec                   | 15.4                                | 32.4               |
| Canada           | Northwest Territories    | 17.4                                | 29.6               |
| USA              | Nevada                   | 20.5                                | 22.6               |
| Canada           | Newfoundland             | 22.7                                | 27.9               |
| Canada           | Yukon                    | 25.2                                | 35.9               |
| USA              | Alaska                   | 27.0                                | 29.3               |
| Canada           | Alberta                  | 27.0                                | 39.5               |
| Canada           | Ontario                  | 28.0                                | 42.4               |
| Chile            |                          | 28.5                                | 28.3               |
| Canada           | New Brunswick            | 28.8                                | 39.4               |
| Canada           | Nova Scotia              | 30.3                                | 37.2               |
| USA              | Arizona                  | 31.0                                | 29.2               |
| Canada           | British Columbia         | 33.4                                | 43.0               |
| <b>Australia</b> | <b>Queensland</b>        | 36.3                                | 33.1               |
| Canada           | Manitoba                 | 37.9                                | 43.0               |
| <b>Australia</b> | <b>South Australia</b>   | 38.2                                | 33.8               |
| <b>Indonesia</b> |                          | 43.1                                | 37.8               |
| <b>Australia</b> | <b>New South Wales</b>   | 44.2                                | 36.1               |
| <b>Brazil</b>    |                          | 45.3                                | 40.2               |
| <b>Australia</b> | <b>Western Australia</b> | 48.2                                | 37.6               |
| <b>Mexico</b>    |                          | 54.6                                | 46.0               |

Note: States highlighted in bold have significantly regressive tax regimes.

Source: Intergovernmental Working Group on the Mineral Industry, 1993a.

the enterprise to another county. Conversely a nation with a poor resource endowment has to acknowledge this situation and adapt its policies accordingly.

From the point of view of the government a key characteristic of the mining industry is that minerals are a non-renewable resource. A well-managed factory can stay in business for a hundred years or more, provided it can obtain its raw materials and keep its place in the market. Strategic mistakes can be corrected. A mining project, on the other hand, has a definite life. Indeed a specific mineral resource in any given country may become exhausted under prevailing market conditions.

A government has the responsibility to design a legal and fiscal regime which encourages responsible exploitation of the nation's resources, while at the same time seeking a fair distribution of the proceeds between the government and the companies. This latter requirement is all the more important because of the low-labour intensity of the modern mining industry. Direct employment in a mine is likely to be small and mines lying in remote areas will have few indirect spin-offs for the population at large.

To obtain benefit for the whole country the government must design a fiscal regime that captures enough of the profit to satisfy the aspirations of the country, while leaving the mining company with sufficient profit to justify its investment. Once again the high level of risk and uncertainty associated with the natural resource industries come into play. A tax regime has to take into account the geological uncertainty concerning the size and nature of the resource, as well as the volatility of the metal markets and the unpredictability of input costs.

For these reasons the mining industry, as well as the petroleum industry, require special tax regimes.

### Reconciling the objectives of government and the companies

The objectives of companies and governments are quite different, and the mining industry is no exception.

A company's main objectives are, or should be, purely commercial. Each company will have its own criteria with which to evaluate the relative attractiveness of different projects. These will include such measures as net present value (NPV), internal rate of return (IRR) and pay back. A key aspect of all these criteria is that they will be based on discounted cash flow; these measures take into account the fact that money has a time value, and that money today is more valuable than money tomorrow. Further requirements are likely to include the ability to control the management of the project and the right to repatriate funds.

The governments list of objectives will be longer and more complex. The maximisation of revenue is the one common factor with the company's objectives, except that the government may calculate the value of the revenue on a different basis. Further objectives of the government may include:

- increasing foreign exchange revenue,
- reducing risk with respect to both any capital invested by the government and the scale of potential revenue,
- controlling the manner of exploitation,

- maximising the potential for economic and social development in the area of the mine
- building linkages between the mining and other sectors of the economy,
- maximising the transfer of technology and skills.

The government has the responsibility of designing a legal and fiscal regime which allows both sides to achieve the objectives to an acceptable degree. Or in words attributed to Loius XIV's Controller-General of Finance, J.B.Colbert (1619–1683):

"The art of taxation consists of plucking the goose so as to obtain the largest amount of feathers with the least possible amount of hissing."

In the competitive international arena of today, the problem facing the government is to tax the mining companies in such a way that the companies see the opportunity for a fair rate of return, yet leaving the country with a reasonable share of benefits. An effective tax regime resembles a bargain reached in the street market. The interests of both sides have to be satisfied or no sale takes place.

Two key concepts lie at the core of an effective tax regime and provide the basis for the compromise or bargain: economic rent and discount rate. This is not a paper in pure economics so discussion will be at a practical rather than at a theoretical level.

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### Table 2. Selected complementary interpretations of the term "Economic Rent"

"Excess of total revenue derived from an activity over the sum of the supply prices of all capital, labour and other inputs required to undertake that activity."

"Profits which exceed those whose prospect the investor would have required."

"The difference between the cost of production for given deposit and the cost of production for a marginal deposit."

Sources: The first two definitions come from Garnaut and Ross (1983); the third definition comes from Hughes (1975).

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## **Economic rent**

Table 2 presents a number of complementary interpretations of the term economic rent as applied to the mining industry. In simple terms, the economic rent from a mine project equals the total revenue less the costs of production which include all of the following:

- exploration costs,
- mine construction costs,
- operating costs,
- competitive rate of return.

Of fundamental importance to the concept of economic rent is the inclusion of a competitive rate of return in the company's costs. The required level of return for a particular project will depend on the nature and scale of the project and on the country-risk. Further the required rate of return will vary from company to company, even for a single project. However, the higher the country risk, the higher the required rate of return is likely to be, regardless of the company.

The significance of "economic rent" is that the government should limit its tax take to the economic rent. In a perfect world, the tax take could precisely equal the economic rent, in which case the tax regime is "neutral": that is, it does not deter investments which would otherwise take place, nor does it encourage investments which would not otherwise be made.

A government faces a number of dilemmas in this context. First, a high level of political or macro-economic risk adds to the effective cost of a project and thus reduces the amount of economic rent which can be taxed.

A second problem is defining the economic rent for a project. The number of unknowns are legion, and they relate mainly to those features of the mining industry discussed above: geology, costs and markets. A further unknown is the competitive return required by the individual company. Each company has its own "hurdle rates" and these are likely to be a closely guarded secret.

Finally, it can be argued that a government should not seek to capture the economic rent in its entirety. The company should be allowed the opportunity to earn higher than expected profits for highly successful projects, if only to compensate it for the numerous less successful ventures.

The challenge for the government is to design a fiscal regime which takes a large share of the economic rent without exceeding the amount of available rent. This regime has to be capable of coping with the uncertainties relating to defining in advance the level of rent from each project, and with the large variability of projects, with respect to both size and profitability.

The key to an effective fiscal regime is to direct taxes at profits rather than at revenue.

## **Discount rate**

The time value of money is a familiar concept in private business. Money in the hand today is more valuable than money tomorrow, because money received today can be put to work to earn more money tomorrow. "Discount rate" is a measure of this time value of money and is equivalent to the inverse of an interest rate.

The discount rate used in cash flow projections in order to recalibrate future cash flow in terms of its value today. Companies or individuals who are averse to risk and have short-term ambitions will tend to use a high discount rate and place little value on money earned far in the future. Organisations which have a long-term vision and are in a position to accept a higher level of risk should use a lower discount rate. For them money earned in the future can have significant value.

This distinction lies at the heart of the compromise to be sought between mining companies and governments. Companies necessarily have a relatively short-term vision. They have to make profits rapidly to satisfy shareholders and

creditors. Governments, on the other hand, can hold a longer term view, for the overall economic development of their country should be their primary objective. Further, the government does not face political risk as the foreign company does. For both these reasons the host government can afford to use a lower discount rate than private companies. That is to say, the government should be prepared to wait longer than the company for its share of the "profit" from a mine.

## **The compromise**

Following these arguments, one solution is that governments should only tax profits and that the aggregate tax raised from a project should be no greater than the economic rent. A further refinement is that no tax should be paid until the project breaks even in terms of discounted cash flow. This is the objective of the "resource rent tax" proposed by Garnaut and Ross.<sup>7</sup>

This solution ignores the political and economic realities of government. The government must be guaranteed some income from all major mining projects, and this revenue should flow, all be it at a low level, from the time production starts.<sup>8</sup>

An effective tax regime balances the company's requirement for early cash flow with the government's desire for secure revenue, whilst recognising the ability of the government to wait longer for its "share of the profits."

## **The characteristics of tax regimes – criteria for evaluating a tax regime**

The literature is replete with publications defining the criteria against which mineral tax regimes and individual taxes should be judged.<sup>9</sup> A small selection of criteria has been chosen for the purposes of this paper:

- neutrality,
- minimum early tax take,
- a balance of risk between government and company,

- stability,
- predictability,
- ease of imposition and administration.

These criteria can be considered in two groups. The first three elements on the list depend on the quantitative character of the tax regime, and these have already been covered in the previous section ("Reconciling the objectives of government and the companies"). The last three criteria flow more from the general nature of the fiscal package rather than from the details. These will be addressed in more detail below.

### Stability

Within the first group of criteria, the requirement for stability is probably the most important for companies. A mining project may have a life of fifty years or more from the time exploration starts. A potential investor will evaluate the probability that the fiscal system will remain relatively unchanged over this period. This will depend on two factors: political stability and fiscal stability. The first of these has already been mentioned and will be discussed no further.

One mechanism for attempting to achieve fiscal stability for the life of a project is to insert "stabilisation" clauses into contracts. These generally state that the project shall not be subject to any tax changes which are potentially unfavourable for the project. This approach may look good on paper, but it suffers from two deficiencies. Firstly, the enforcement is uncertain in international law.<sup>10</sup> Secondly, the desire for stabilisation clauses fails to acknowledge the root cause of changes in resource tax regimes.

As discussed above, the mining industry is highly unpredictable. Geology, costs and market prices conspire to create a business where the "economic rent" available from a country, a geological province or a single mine cannot be forecast with any degree of certainty. market

prices may double, resulting in the government seeking to extract a higher proportion of rent. Individual deposits may turn out to be smaller or more costly than predicted, in which case the companies may demand tax concessions.

A stable tax regime is therefore not one which is cast in stone. Such a regime may be appropriate under circumstances prevailing at the time, but any dramatic changes in potential reward are likely to be followed by demands for re-negotiation from one side. Rather, stability is achieved through flexibility, and flexibility is achieved through the tax burden being dependent primarily on profit and only secondarily on revenue.<sup>11</sup>

### Predictability

The predictability of a tax regime has two components. The first concerns the transparency and clarity of the tax regulations.

Do they allow the company to predict with certainty the tax liability of the project at a given level of activity, revenue and profit? If not, the company cannot calculate the potential returns on the project.

The second component concerns the degree to which the fiscal terms are negotiable. Tax rates are commonly included in legislation and are applied uniformly to all companies operating in a country. However some governments prefer to negotiate tax rates on a project-specific basis. This may be appropriate if the size and nature of the deposit has already been determined. Companies will tend to find this method less attractive at the exploration stage.<sup>12</sup>

### Ease of imposition and administration

Imposition and administration are opposite sides of a coin. Imposition is the task

**Table 3. Classified list of taxation mechanisms commonly used in the mining industry, including most taxes and levies applied in Brazil in recent years (*indicated in italics*).**

| Category                             | General taxes   | Mining taxes  |
|--------------------------------------|---|---|
| <b>Presence related</b>              | Capital tax<br><i>Real estate tax (F/M)</i><br><i>Import tax (F)</i><br><i>Payroll tax (F)</i>  | Bonus bidding<br>Fixed fee/bonus                            |
| <b>Revenue or production related</b> | <i>Excise tax "IPI"(F)</i><br><i>Service tax "ISS"(M)</i><br><i>Sales tax "ICMS"(S)</i><br><i>Social security "COFINS"(F)</i><br><i>Social integration "PIS"(F)</i> | <i>Financial compensation (F,S,M)</i><br><i>Royalty (L)</i> |
| <b>Profit related</b>                | <i>Income tax (F)</i><br><i>Higher rate of income tax (F)</i><br><i>Withholding tax (F)</i><br><i>Surtax (S)</i>  | Windfall profits tax  |
| <b>NPV-related</b>                   |   | Resource rent tax<br>Brown tax                              |

**Note:** The level at which the tax is taken is indicated by: F = Federal; S = State; M = Municipal; L = Landowner.

**Source:** See Garnaut and Ross (1983) for definitions of the profit and NPV-related taxes. Details of Brazil's tax regime taken from Intergovernmental Working Group on the Mineral Industry (1993b) and Paredes and Novotny (1996).

of setting the rates of individual taxes so that they are consistent with the overall fiscal strategy. Administration is the task of enforcing the tax system so as to collect the revenue due.<sup>13</sup>

It is an unfortunate fact of life that taxes which are easy to impose are commonly difficult to administer, and vice-versa. For example, certain modern taxes designed to target positive discounted cash flow (such as Resource Rent Tax) are easy to impose but notoriously difficult to administer.<sup>14</sup> Conversely, flat-rate fees and royalty are easy to administer, but if they form a significant part of the tax burden, the task of determining the appropriate rates of taxation is not easy.<sup>15</sup>

#### Character of individual taxes

For the purposes of this paper individual taxes may be classified according to their target:

- "presence-related" taxes are imposed on a company regardless of whether it has any revenue.
- "revenue or production-related taxes" are imposed after production starts, but take no account of profitability.
- "profit-related" taxes target accounting profit, but do not consider the time value of money. NPV-related

taxes are dependent on the NPV (Net Present Value) of the project exceeding zero. That is to say, the tax is imposed only when the project makes a profit in terms of discounted cash flow.

Table 3 lists a number of taxes common to the mining industry, grouped into these four categories. The taxes fall into two overall groups: those imposed on all industries, and those which tend to be specific to mining or resources projects. This listing is far from exhaustive, but it does include most taxes levied on mining companies in Brazil.

The overall character of each of these categories of tax is summarised in Table 4 using some of the criteria outlined above.

Consideration of Tables 3 and 4 together reveals that tax regimes which are heavily dependent on "presence-related" and "revenue or production-related" taxes are likely to be unfavourable for private companies. Further, such taxes formed a large part of Brazil's tax regime in the early 1990s.

#### Regulations as fiscal instruments

A government tax accountant may define a tax as "a compulsory levy made by public authorities for which nothing is received directly in return".<sup>16</sup> A commercial analyst in a private company may

take a slightly broader view and include any obligation imposed by a public authority which adds to the company's cost of doing business.<sup>17</sup> Thus a company's assessment of the "fiscal" regime of a particular country might include regulations on any of the following:

- ownership of enterprises,
- foreign exchange regulations,
- requirements to use local services,
- local development obligations,
- employment of nationals,
- training and technology transfer,
- environmental protection,
- administrative procedures.

Few, if any, of such regulations are directed at profit. Most add to the cost of doing business, even before the mine produces any revenue. Their impact on the company's discounted cash flow may therefore be considerable. That is not to deny that such regulations may be desirable, even necessary. But the cost to the company must be recognised, and if this cost is too high, companies will not invest.

#### Tax allowances in the mining industry

In recent years the mining industry in Brazil has been granted no special tax benefits or allowances. The case for special treatment of the mining industry has been argued above ("Why is the mining industry special?"). In the context of tax allowances the key feature is the high risk of exploration and the huge expense of mine construction.

The two standard ways of dealing with capital expenditure for tax purposes are expensing and capitalising. Expensing involves deducting the costs from revenue in the year the costs are incurred. This is appropriate if the company already has large earnings in the country and if it is allowed to offset capital costs in one project against earnings in another.

Capitalising costs involves spreading the costs over a number of subsequent

**Table 4. Simplified summary of key characteristics of selected types of taxation.**

|                        | Presence-related taxes | Revenue-related taxes | Profit-related taxes | NPV-related taxes |
|------------------------|------------------------|-----------------------|----------------------|-------------------|
| Neutrality             | Low                    | Low                   | Moderate             | Low               |
| Early tax take         | High                   | High                  | Moderate             | Low               |
| Government risk        | Low                    | Low                   | Moderate             | High              |
| Stability              | Low                    | Low                   | Moderate             | Moderate-High     |
| Ease of administration | High                   | High                  | Moderate             | Low               |
| Ease of imposition     | Low                    | Low                   | Moderate             | High              |

Source: Modified from Garnaut and Ross, 1983.

**Table 5. Simplified classification of the treatment of mineral exploration and development expenses offered by selected countries**

| Treatment                                      | Exploration expenses         | Development expenses         |
|--|------------------------------|------------------------------|
| Deduct as income or carry forward indefinitely | Canada<br>Australia          | Canada                       |
| Deduct as income or amortise                   | Brazil<br>USA<br>Philippines | Brazil<br>USA<br>Philippines |
| Amortise only                                  | Chile                        | Australia<br>Chile           |

Source: Intergovernmental Working Group on the Mineral Industry, 1993c.

years according to a predetermined formula of depreciation or amortisation. This is appropriate if the company has insufficient sources of revenue at the time the expenses are incurred. The weaknesses of this approach is that the schedule of depreciation or amortisation may be fixed in legislation and may be commercially unattractive.

A third alternative is to allow the company to carry forward the costs indefinitely and to choose when to deduct them.

Brazil offers the mining company the choice of either deducting the expenses when they are incurred, or amortising them according to a fixed schedule. This applies to both exploration and development expenditure.

Table 5 shows the approaches taken by other major mining nations. Of the countries selected, Canada clearly offers the most favourable conditions in this respect, granting the company the choice of expensing or indefinite carry forward, for both exploration and development expenditure. Brazil falls into the middle group, offering a choice of expensing or capitalising, without giving the company the flexibility of indefinite carry forward.

As well as being attractive in this respect, Canada offers other incentives for exploration and development:

- investment tax credits,
- flow-through shares,
- an uplift of exploration and development expenditure in certain provinces.

Flow-through share allow individual shareholders to benefit from tax deductions relating to exploration and development costs. This mechanism is optional, not compulsory, and is particularly suitable for small companies raising equity for exploration programmes.<sup>18</sup>

An "uplift" refers to the ability of mining companies to augment the deductible exploration and development expenses by a certain percentage (the "uplift"). In other words, they can deduct more than they spend. The amount of "uplift" is as high as 50 per cent in one province.

These and other forms of tax allowance should be used selectively and with care. The aim should be to provide the mining industry with those incentives which are required to achieve the desired level of investment - and no more. An excessively high level of allowances results in the government subsidising unsuitable investments. In the case of the British offshore oil industry it can be argued that the level of exploration incentives was so high as to encourage an excessive amount of exploration drilling, resulting in lost revenue for the government.

## Mineral taxation in federal systems

In the previous section mention was made of tax allowances granted by individual provinces in Canada. This emphasises the potential flexibility of federal systems of government. However care must be taken to ensure that a system with taxation at different levels of government does not result in an excessive or unsuitable tax burden for the investor.

Brazil's federal system allows "tax" in some form to be taken at four levels:<sup>19</sup>

- federal taxes and royalty ("financial compensation"),
- state taxes,
- municipal taxes,
- landowner royalty.

Thus, not only does Brazil's fiscal system for mining companies emphasise taxes relating to presence, production and revenue (see above), but it also has the complication of multiple levels of government competing for their share of the take.

A federal system does not necessarily result in a tax regime which is unfavourable for foreign investment. However a federal system runs the risk of leading to one or more of the following:

- an excessive tax burden for mining companies,
- a tax regime in which profit,
- related taxes form a small part,
- excessive administration for the company.
- the inability of the federal government to encourage foreign investment.

The federal government can choose from a number of approaches to prevent the tax regime showing these characteristics. These include:

- withdrawing the tax,
- raising powers of lower levels of government in the mining sector, and negotiating a method of compensat-

ing local government for the loss of revenue,

- reducing the tax,
- raising powers of the states and municipalities, either by reducing tax rates or by abolishing certain forms of tax,
- treating certain forms of local tax as a deductible expense for federal income tax,
- encouraging lower levels of government to tax on the basis of profit rather than production,
- providing federal allowances for exploration and development (see above for discussion of allowances).

Again Canada shows how this problem may be approached.<sup>20</sup> The predominant form of taxation is income tax, both at federal and provincial level, and these apply to all industries. In addition the provinces impose mining taxes which either consist solely of a further profits tax, or comprise a combination of royalty and income tax, depending on the province.

Before 1974 the provincial mining taxes were treated as a deductible expenses for the purposes of federal income tax. In the early 1970s provinces increased the rates of their mining taxes in response to rising mineral prices. Facing a massive loss of revenue, the federal government cancelled this income tax allowance. As an alternative the federal government introduced a fixed tax abatement for mining companies known as Resource Allowance. This resulted in a 25 per cent reduction in the federal income tax payable by mining companies, in recognition of the high level of mining tax being paid to the provinces.

The key features of the Canadian tax regime for the mining industry are that both federal and provincial governments focus on profit-related taxes and offer generous exploration and development allowances. This contrasts with the fiscal

system for mining in Australia. Here the state taxes have no profit-related element and are characterised by land and payroll taxes and royalty.<sup>21</sup> Further, the allowances for exploration and development are less generous than Canada's (Table 5). It is therefore not surprising that the effective tax rates in most Australian states is greater than in most Canadian provinces (Table 1). The heavy emphasis on non-profit taxes in Australia also makes the regimes there regressive; that is to say less profitable ventures pay a higher effective rate of tax than more profitable ones.

In the context of Brazil, the critical requirement for improving the federal system of taxation is the involvement of all levels of government in the debate.

Without the understanding and cooperation of the State and Municipal authorities, any radical overhaul of the tax regime by the central government may be obstructed or offset by local administrations.

### Conclusions

The low level of foreign investment in Brazil's mining industry seems to be a direct result of the fiscal and regulatory regime for mining. Despite the high level of proven and potential mineral reserves, the combination of inappropriate taxation and high political risk places Brazil in an unfavourable position in the global market for foreign investment in mining.

The mining industry has a number of special characteristics: notably large capital requirements, long lead-times and high risk. Thus the mining sector in any country requires a tax regime which is different from that which applies to most other industrial or commercial activities.

An effective tax regime for mining should seek to satisfy the requirements of both the government and the companies. The government take from a project should not exceed the project's economic rent; that is to say, the company should

be allowed to recover all its costs, including an appropriate level of return. This objective is more likely to be achieved if taxation is directed at profit rather than at revenue. Although profit-related taxes reduce the government's take in the early stages of the project, the state is, or should be, in a better position to wait longer for revenue than the company which has to satisfy its shareholders. The discount rate for a government is usually lower than that for a company and this is the key to the compromise between governments and companies.

Exploration and development expenses in the mining industry may run into billions of dollars for a single large mine. In order to attract such investment, the mining sector requires special allowances. These can include the option to carry forward indefinitely and recover at a time of the company's choosing. A number of mechanisms are available and have been tried and tested around the world. To date, Brazil has lacked any tax allowance mechanism directed at the mining industry.

The final issue to be addressed is that of taxation in a federal system. At present Brazil grants tax or royalty-raising powers to three levels of government as well as to the landowner. For the tax regime to satisfy the criteria discussed in this paper, the focus of the taxes at levels below the federal government should be shifted from revenue to profit. Further, a way has to be found to limit the overall tax take and the administrative burden imposed by four tiers of "taxation."

### Notes

1. Waelde, 1991.
2. Davis, 1995.
3. The Economist, 1996.
4. Intergovernmental Working Group on the Mineral Industry, 1993a.
5. Cunha Filho, 1995.
6. Since 1993 Brazil's tax regime for minerals has undergone a number of changes in-



cluding the reduction in the level of profit-related taxes, the abolition of withholding tax and the removal of a tax on mineral exports (ICMS).

7. Garnaut and Ross, 1983.
8. Nellist, 1996; Waelde, 1996.
9. Kumar, 1991; Nellist, 1996; Otto, 1992a; Garnaut and Ross, 1983.
10. Waelde and Ndi, 1996.
11. Garnaut and Ross, 1983.
12. Otto, 1992b.
13. Garnaut and Ross, 1983.
14. Land, 1995.
15. Garnaut and Ross, 1983.
16. James and Nobles, 1992.
17. Otto, 1992c.
18. Parsons, 1995.
19. See Table 3. Martins and dos Reis, 1996.
20. R. Parsons, 1995
21. Mannix and Stals, 1995; Intergovernmental Working Group on the Mineral Industry, 1993d.

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