Government Approaches to Mineral Policy and Taxation

Keith J. Brewer
Natural Resources Canada
Gilles Bergevin
Natural Resources Canada
Brian R. McCullough
Natural Resources Canada

Abstract

Globalization impacts all stakeholders, including governments, corporations, and investors. As most of the world continues to adopt free trade and the free flow of capital, today's investors have more choice in terms of projects and countries for their potential investment. Attracting ongoing investment into the mining sector requires corporations to find, and desire to develop, potentially valuable projects that are expected to yield sufficiently high after-tax returns to warrant the associated project risk. Meanwhile, governments must balance the needs of the potential mining project investor with governments' domestic economic and social objectives. A government cannot accomplish this balancing act in isolation because, every day, the actions of multi-national enterprises (MNE) and other governments, as well as changes in economic parameters, alter the competitive forces at play.

The authors concede that no generic solution exists; instead, they offer some insight for a jurisdiction when the government is contemplating designing a new (or redesigning an existing) mining tax regime. In addressing the sorts of issues that governments might consider, the authors present a range of tax policy options and associated evaluation criteria. This paper evaluates a limited set of hypothetical tax regimes to illustrate some potential consequences of a government selecting a particular tax regime design.

Résumés

Keith J. Brewer
Dr. Keith Brewer is Director General of the Economic and Financial Analysis Branch, Minerals and Metals Sector, in the Canadian federal Department of Natural Resources; previously he held a number of positions with the Department of Fisheries and Oceans, the Department of the Environment, and the Bedford Institute of Oceanography. Before entering the public sector, he was an electronics engineer with Philips Electrical Ltd. in England and the Netherlands. In 1971-72, he taught Economics at Queen's University in Ontario, Canada. Dr. Brewer has a Ph.D. (McGill University) and an MA (University of Alberta) in Economics, as well as an MA and BA in Natural Science (Oxford University, England). He now specializes in resource economics and policy, competitiveness, and taxation, and has lectured and conducted seminars widely on the global business climate for mining investment. He advises governments in Canada and internationally on optimum policies for the development of mineral resources.

Gilles Bergevin
Mr. Gilles Bergevin is Chief, Tax Policy, of the Tax and Mineral Resources Division, Economic and Financial Analysis Branch, Minerals and Metals Sector, Natural Resources Canada (NRCan). He has been with NRCan (previously known as Energy, Mines and Resources) since1978, and obtained his current position in 1983. In addition to his degree in geology, Mr. Bergevin has a B.Sc. and a M.Sc. in economics, and has been closely associated with the different facets of resource taxation. He has extensive experience in the area of resource taxation modeling and tax policy development.

Brian R. McCullough
Mr. Brian McCullough earned his Masters of Business Administration (University of Alberta), with an emphasis on finance, in 1997; Mr. McCullough also holds a Bachelor of Commerce (University of British Columbia), granted in 1991, with an honours specialization in Commerce and Computer Science. Mr. McCullough joined the Department of NRCan in 1997. Currently, he is a financial analyst in the Tax and Mineral Resources Division, Economic and Financial Analysis Branch, Minerals and Metals Sector. Mr. McCullough brings to his position a breadth of experience and expertise in corporate finance, financial modeling, and software engineering. Before joining the Department, Mr. McCullough acquired over five years of experience as a software developer for Statistics Canada and for Computer Associates International.

1. OBJECTIVES OF TAX SYSTEM DESIGN

Government objectives are critical elements of the design of a tax system. Accordingly, they should be defined as the basic criteria upon which to evaluate results. Most common objectives are as follows:

- Maintaining existing production capacity and fostering new investment, to achieve economic growth and long-term job creation based on the existence of mineral resources in the jurisdiction;
- "Fair" sharing of resource revenues, over the life of mining projects, between company/investor and government
- Steady flow of tax revenues; and
- Simplicity and a high degree of compliance.

Some of the above objectives are conflicting. For example, an onerous income tax system may not be conducive to new mining investment unless a preferential tax treatment is accorded to mining. Also, when existing operations are not profitable, it may not be possible to maintain a steady flow of taxation revenues - an inflexible tax system that attempts to do so may force mine closures, thus perhaps compromising the government's longer-term objectives of economic growth. Thus, it is important that objectives are assigned priority, to allow a decision in case of conflict. Priorities may be established through a negotiation process.

2. PRACTICAL OPTIONS OF TAX SYSTEM DESIGN

2.1 The Three Main Variables in Mining Tax Design

- Types of tax instruments to be used (e.g., tax on income versus tax on production)
- Tax rates
- Tax base (depreciation-amortization rates, super deductions, tax holidays, temporary or permanent exemptions, etc.)

2.2 Choosing a Mix of Tax Instruments

The choice and emphasis of tax instruments follows from the government's mix of objectives, and from the expected profitability range of mining projects to be affected by the tax instruments. In the simplest case, a government has to deal with an existing income tax system of general application that it may wish to complement with a production royalty or an income-based mining tax in order to achieve its objectives with respect to mining. Given the nature of the existing income tax regime, the choice between a production royalty and an income-based mining tax may have a critical impact in the shaping of a country's mining industry. The choice of a tax instrument mix, therefore, constitutes the first major decision to be made by the planners of a mining taxation policy.

Production taxes theoretically provide a steady flow of revenues to government and are simple to administer. However, by design, they are insensitive to the mining project's ability to pay the tax, as measured by the profit

margin. As a result, unless production taxes are set at a token rate, they always impose a cost on businesses that falls proportionally most heavily on mines that are the least profitable. In the extreme (but quite possible) case of a mine operating temporarily at a loss, the project is effectively subjected to an infinitely high tax rate in reference to its profit margin. This situation can precipitate the premature closure of a mine. In the common case of a moderately profitable mine - but subject as well to characteristic cyclical product prices - even a modest production tax can bring the level of profitability below the level required by investors, a situation that could prevent the bringing into production of a worthwhile project. Production taxes are most useful when prospective projects are within a range of robust profitability. In these circumstances, an appropriate tax rate might be able to be determined so as to provide adequate government revenues without compromising the viability of projects that the government wants to encourage.

Tax regimes that try to generate a large proportion of revenues by means of production royalties across many mining projects tend to be relatively unstable. A unique production tax rate that applies to all projects will either be too high to foster investment in moderately profitable projects, or too low to satisfy government revenue requirements for very profitable projects. To counter this instability, a common government approach has been to negotiate a separate tax rate for each new mining project, or category of projects (e.g., by commodity or by region).

Income-based taxes are most appropriate when prospective projects are numerous, project profitability is highly variable across projects, and government wants to achieve the least economic distortion and maximum economic growth from the range of projects as a whole. Fairness is achieved with a single flat rate, and distortions in the allocation of capital are minimized because the tax take is directly proportional to profitability. However, income-based taxes also mean unstable and unpredictable revenues for governments from each project, but this disadvantage disappears if the jurisdiction has a large number and range of mining projects in production where the profit cycles of the projects are out of phase with each other. These types of taxes also tend to be more complex and compliance costs are higher than for production taxes.

2.3 Setting Tax Rates

Once tax policy planners have determined the types of tax instruments they want to implement, the next critical step is to set out the tax rates. The setting of tax rates will determine the relative weight of the tax instruments in place. It is also the most important and visible means by which a government can send signals to prospective investors about its willingness to do business.

Before setting out the tax instrument mix and the corresponding tax rates, reference to current international practices can provide helpful guidelines. With respect to mining taxation, a majority of jurisdictions are currently using a mix of a broadly applied income tax system that also may be in conjunction with a production royalty regime that focuses on mining activity. Tax rates are mostly set to give a dominant weight to income tax revenues. Income tax rates range from 15% to 45% with a concentration of jurisdictions in the area of 30% to 35%. Production tax rates range from 0% to 15%, but most jurisdictions have rates that are below 5% (2% to 3% is the norm).

2.4 Adjusting the Tax Base

The adjustment of the tax base is an important step in the design of a mining tax regime. Tax policy planners can fine-tune a tax system to:

- achieve certain specific results (such as by means of tax credit or flow-through mechanisms to stimulate mineral exploration, special allowances to encourage further processing, or measures to facilitate compliance with environmental rules and mine-site reclamation regulations); and
- alleviate certain undesirable characteristics or side effects of the chosen tax instrument mix. For example, basic exemptions or temporary relief measures (e.g., tied to commodity prices) can reduce the regressive character of a production tax; alternatively, on the income tax side, accelerated depreciation and amortization can achieve a similar result.

3. TAX MODELING OF REVENUE GENERATING OPTIONS

3.1 Five Cases

In this section, we consider how a government's choice of tax revenue-generating options could impact the after-tax situation of a project. To illustrate how the revenue-generating options impact potential projects, the authors constructed five cases as shown in Table 1. The five models were built using three different taxes; jurisdictions commonly incorporate, or at least consider, one or more of these types of taxes. Profit taxes are the most common, while some jurisdictions impose either a gross mining royalty or an export tax in lieu of a royalty. An export tax was incorporated because some jurisdictions have introduced a gold export tax, which might be manifested through selling to the Central Bank at 90% of the world price.

TABLE 1 Tax Cases

Model	Profit Tax	Gross Mining Royalty	Export Tax
Case 1	40%	0%	0%
Case 2	35%	2%	0%
Case 3	35%	5%	0%
Case 4	25%	2%	10%
Case 5	25%	0%	0%

3.2 Evaluation of the Five Cases

The measure of the magnitude of taxes in the five cases is "the average effective tax rate," namely, "the fraction of project profits that is taken as taxes by the taxing authority." Net present value techniques are utilized to take account of annual differences in taxes over the life of the mine. Calculations are made for projects with two levels of profitability, namely 10% internal rate of return (IRR) and 25% IRR. The results are shown in Figure 1.

3.3 Average Effective Tax Rates (AETR) for the Five Hypothetical Tax Cases

For the low-profitability (10% IRR) project, the effective tax rates range from 22.4% to 87%. On the other hand, more profitable projects encounter effective tax rates from 22.8% to 43.7%. Two obvious conclusions stand out. First, different combinations of the profit tax rate, gross royalty or an export tax do result in quite large differences in tax payment obligations, ranging from 22% to 87% of profits in the case of a less profitable project.

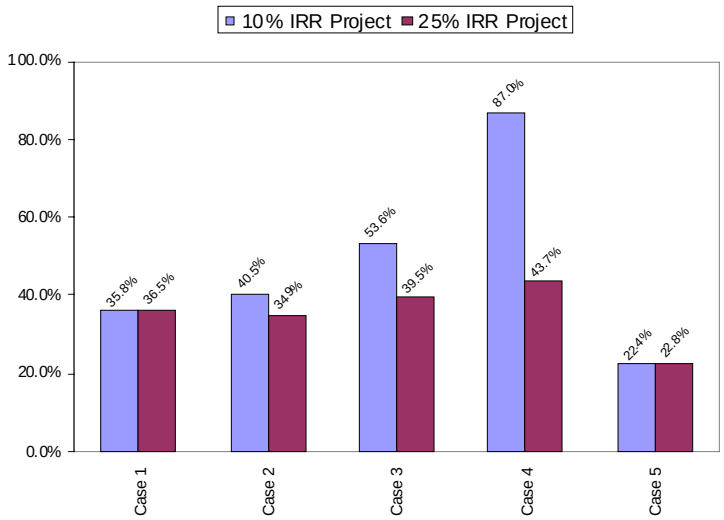
Secondly, the proportion of a project's before-tax profit that is taken as tax is lower at higher project profitability.

Several other observations are also important:

- Cases 1 and 5 reflect that a purely profit-based regime is not more onerous on lower profit projects. Cases 3 and 4 clearly illustrate that a tax regime becomes strongly regressive if production tax rates are significantly above 2%. At a royalty rate of 5%, short of a drastic manipulation of the tax base, the tax regime will remain burdensome for moderately profitable mines. A 5% rate is close to the maximum royalty rate that a jurisdiction could charge without deterring new investment, unless the jurisdiction is endowed with abnormally rich, known, mineral deposits.
- Higher profit projects are impacted proportionally less, compared to lower profit projects, in jurisdictions incorporating a gross royalty and/or an export tax. This fact can be observed by examining Cases 2, 3, and 4.
- An export tax, under most circumstances, has the same effect as a gross royalty. Consider Case 4 — the low profitable project is hit very harshly because the 10% export tax and 2% royalty combine to be effectively a 12% tax on gross revenues. Case 4 represents the approach that jurisdictions most concerned with generating steady

revenue flows may be tempted to pursue. Known, highly profitable, projects can still prosper, but projects that are less than outstanding may become non-viable. Burdensome taxation at low levels of profitability aggravates the risk of failure without proper compensatory reward on the upside. Potential investors have very limited incentive to take risk, and it is likely that exploration investment will remain low.

FIGURE 1 Comparing the Five Hypothetical Tax Models to the World (10% IRR Case)



In interpreting the range of results demonstrated by the five cases, a few aspects need to be made clear. First, these overall "tax burdens" are calculated over the 10-year life of our model mining project. Second, the annual tax payments differ between cases because each case reflects a different tax regime and different tax rates. The cases can be compared because they have the same deductions. This analysis offers, therefore, a demonstration of how a government's choice from among different tax revenue-generating options impacts the after-tax situation of projects.

3.4 Global Context

Figures 2 and 3 show the tax burdens represented by these five cases, compared with the tax burdens that have prevailed in a selection of jurisdictions over the past few years.

Figure 2 shows that, for the lower profit (10% IRR) project, Case 1 (the 40% profit tax case) is near the middle of the range, while Case 5 (i.e., a 25% profit tax) would be one of the lowest taxing jurisdictions.

More interestingly, we can see the relative impact of the remaining three choices. Consider Case 4 (the case with the 25% profit tax, and an effective 12% royalty). Such a regime penalizes a low-profit operation. Its 87% effective tax rate would be among the very highest in the world. Realistically, one could create such a regime, but one would not likely attract any marginal investments, if any investments at all. Case 3 (a combination of a 35% profit tax and a 5% gross royalty) also generates a relatively high effective tax rate.

On the other hand, consider the tax effects of the higher profit project in Figure 3. For this 25% IRR project, the overall tax burden of our five cases ranges from 22% to 44%; for the most part, the tax burden for each of the five cases is lower than it is for the low profitability project.

FIGURE 2 Comparing the Five Hypothetical Tax Models to the World (10% IRR Case)

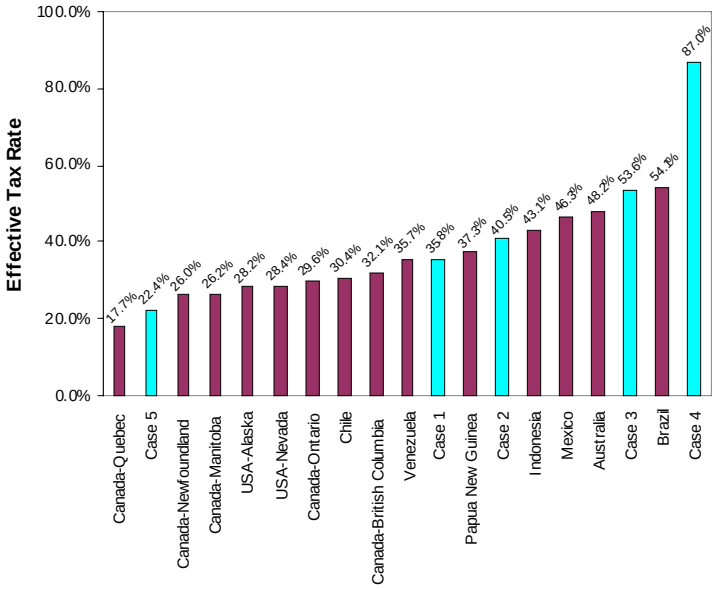
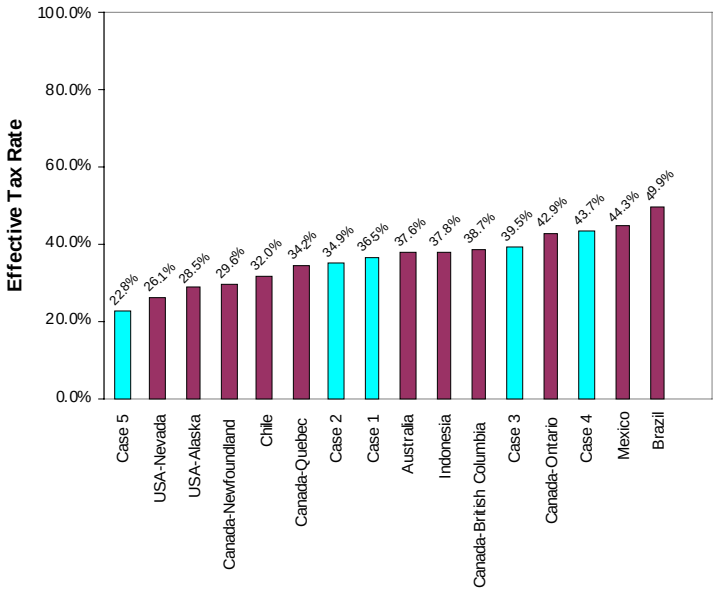


FIGURE 3 Comparing the Five Hypothetical Tax Models to the World (25% IRR Case)



The trend of international tax design stands somewhere close to that of Case 2 (which is achieved here with a 35% income tax rate and a 2% royalty), or perhaps a closer fit might even be with a 30% profit tax plus a 2% royalty. Not discussed here, but important, is that the jurisdictions shown in Figures 2 and 3 do incorporate quite a range of other elements in their tax system design that are instituted for the purpose of achieving the tax burden that the jurisdiction wishes. As an example, the Canadian jurisdictions incorporate relatively fast tax deductions/write-offs relative to

other jurisdictions; that is why the Canadian jurisdictions move more sharply to lower average effective tax rates when project profitability falls, as is demonstrated by moving from Figure 3 to Figure 2.

Goals commonly expressed include:

- a competitive effective tax rate (between 30% and 35%, depending on project profitability);
- a slightly regressive character in the presence of a royalty component, which could be attenuated by government introducing a temporary and partial royalty exemption during the capital cost recovery phase;
- ease of administration; and
- a base level of steady revenue flows for government.

4. NON-PROFIT TAXES

Non-profit taxes are the range of taxes that a jurisdiction may impose on a project where the tax has to be paid irrespective of whether the project has profits. At issue here is whether such costs could prevent investment, in which case the jurisdiction has to balance whether it wishes to impose these types of taxes or not. Examples of such taxes are numerous. They have a range of rationales for their imposition that includes: a fee for a service provided by government (e.g., infrastructure, road, power); revenue raising (e.g., custom duties); insurance (e.g., worker health/safety insurance); and others.

5. MACROECONOMIC POLICIES

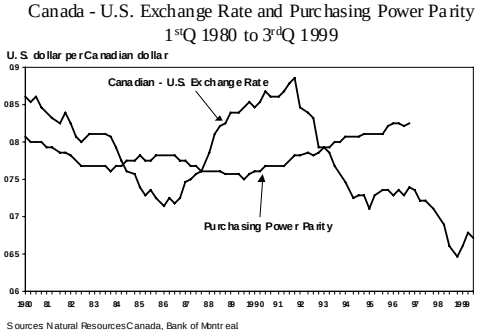
A country's policies that affect general price levels and interest rates in the economy, and the external exchange value of the currency, can have a large influence on the economic viability and financial feasibility of a mining project. Macroeconomic policies are important in their own right, as well as being important through their influence on the level and type of mining tax regime that can be applied successfully from both the point of view of the project and of the government.

The impact and consequence of macroeconomic policies can be large, as is demonstrated in Figure 4 by the recent history of the Canadian dollar exchange rate vis-à-vis the U.S. dollar. In this case, the high interest rates in Canada at the end of the 1980s contributed to very high levels of the Canadian dollar, impacting negatively on the economics of mining and other exporting sectors.

Another question for government, in the context of a declining global trend in mineral prices, is how to adapt the tax system in the face of such a situation. A lot depends on the project cost situation in the jurisdiction in question.

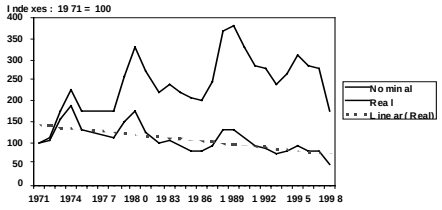
The cost side of a project is especially important in determining the competitiveness or not of a mining project, as is emphasized in Figure 5, which shows the steady decline in real prices for minerals. Figure 6 provides a snapshot for one commodity, namely zinc, comparing the average production costs inside each of the world's major zinc-producing countries. That the curves for each of the two years shown (1997 and 2000) are so flat is testimony to the high degree of competitiveness between countries. It does not take much of a change in tax policy, or macroeconomic policy, to render a project in a particular jurisdiction viable or non-viable. To some degree, it can also be seen from Figure 6 that future years' costs are expected to be lower, which is a reflection both of macroeconomic factors and also of the positive impact of mining company efforts to raise productivity and reduce costs through the methods at their disposal.

FIGURE 4 The Canadian Macroeconomic Situation



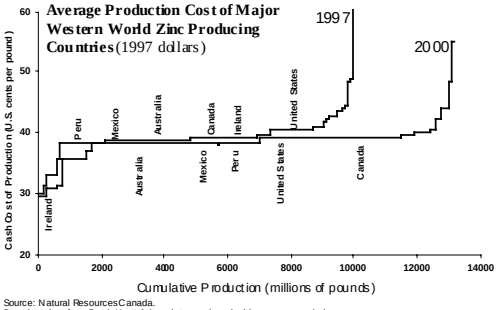
Sources Natural Resources Canada, Bank of Montreal

FIGURE 5 U.S. Dollar-Based Metal Price Index, 1971-99



Note The indexes include copper, lead, zinc, nickel, silver and gold, and are weighted by the relative share of Canadian production of each commodity. The real index is the nominal index adjusted by the GDP implicit price index.
Source: Natural Resources Canada.

FIGURE 6 Relative Competitiveness of World Mining



Source: Natural Resources Canada.
Based on data from Brook Hunt & Associates and used with express permission.

6. OTHER OBJECTIVES AND POLICIES

The preceding sections have focused on taxation and non-taxation policies and practices of a government where the objective relates to the impact of government policies on a project's competitive position. Mention can be made of other specific policies that can be delivered through the tax system:

- exploration (flow-though shares, provincial tax credit policies, prospectors' incentives);
- environment (trust funds for mine reclamation); and
- community (inclusion for tax determination purposes of expenditures on "social" assets – such as hospitals connected to a mine - with expenditures of the mine production assets proper, all of which receive accelerated tax write-offs).

7. CONCLUSION

The establishment and fine-tuning of a mining taxation regime should involve many linked considerations to produce a system that responds to a government's agenda for the jurisdiction. In practice, it is not realistic to think that a tax system can be designed except in relation to the specific characteristics of the jurisdiction in question. These few pages may serve to highlight some important aspects.