AN EVALUATION OF ALTERNATIVE TAX SYSTEMS
APPLICABLE TO THE MINERAL INDUSTRIES

BY

Glenn P. Jenkins
Harvard University

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Governments in their pursuit of revenue from mineral enterprises, have resorted to a wide variety of taxes and levies. Michael Faber in his survey of the methods used by the Commonwealth African countries to raise revenue from their mineral industries has found examples of most of these schemes. They can be organized into four broad categories:

(a) fixed charges such as rents, fees, and licence charges,

(b) royalties and other payments levied on the amount or value of the mineral extracted,

(c) taxes levied on the income earned by the enterprise, personal or corporate income taxes, withholding tax, or any other type of income tax such as an excess profits tax,

(d) direct equity participation by the government in the mineral corporation.

Before discussing the specific proposal of the resource rent tax developed in the paper by Ross Garnaut and Anthony C. Ross I wish to point out the advantages and disadvantages inherent in the four broad procedures of revenue collection outlined above. In this way, we will have a better understanding of the attractions and pitfalls inherent in the specific scheme for mineral taxation that has been outlined by Garnaut and Ross.

A. Rents, Fees and Licence Charges

These charges are usually levied as part of the payment to obtain the right to the use of mineral lands, to carry out exploration, or to
operate an enterprise within a jurisdiction. The obvious advantage to these forms of raising government revenue is the administrative ease of their collection. As they are usually a fixed charge per period, then if they are not so large as to prevent the opening of a mineral body for production, they will not alter the marginal variable costs of production and thus not distort the production decision of the mineral enterprise. When combined with a royalty on production to generate a target amount of government revenue, the existence of the fixed fees or rentals per period will enable a lower royalty rate to be set, hence lowering the distorting influence of the royalty on operating decisions.

The disadvantages of such fixed charges is that they are seldom related to the quality of the mineral deposit; therefore, they may distort the decision of whether or not to begin production. Also, since they do not vary with the annual profitability of the project, they will increase the riskiness of the project, where risk is measured by the variance of the annual returns. Because of these features, fixed charges generally will not be effective instruments for the collection of a large proportion of the economic rents that may exist in the mineral sector. Nevertheless, rental and licence fees have constituted approximately 25 percent of the total government revenues from oil production in the province of Alberta, Canada. In this case, these fixed charges have been combined with a scheme of bonus bidding for the sale of mineral rights and a royalty that has been approximately 16 percent of production.3

B. Royalties

Royalties are usually levied as a fixed percentage of the gross value or physical amount of mineral production. In certain situations, such as in the Middle East oil producing countries, while a de facto royalty is collected, it is called an income tax because it is applied to a previously fixed amount of profits per barrel. In this discussion, any tax levied or negotiated as a fixed amount per unit of output prior to production is treated as a royalty. The principle advantage of a royalty as a form of taxation is the ease with which it can be collected. When a government is attempting to levy an income
tax on the profits of a corporation it may have great difficulty determining what is the true amount of profits from the investment. The widespread use of transfer prices between affiliates of integrated multinational corporations, along with the absence of reliable auditing procedures of financial statements in many countries prohibits the use of genuine corporation income tax excess profits tax. On the other hand, the amount of output from the operation can ordinarily be easily identified; thus the government can readily measure the base on which the royalty is to be levied.

As pointed out by Faber, the principle drawback of a flat rate royalty on the production of a mineral is that it is levied on costs as well as economic profits. Such a tax will often lead to bypassing high cost ores in the production from a mineral body that would have been utilized in the absence of the tax. Thus an economic loss is inflicted.

The high-grading effect of a fixed rate royalty can be somewhat overcome by using a variable royalty rate which will move inversely with the costs of production from a mineral body. This is especially important in the case of a mining operation where the quality of the ore may vary greatly within a given mine. While a substantial royalty may be appropriate for the high grade ores, it would cause production from some lower grade deposits to be unprofitable, and these lower grade ores would be wasted. In this case, multiple royalties would be required in order to have economic efficiency even for the production from a single mineral body.

To have a system of variable royalties it requires much of the same information necessary for an effective business income tax. As in the case of the business income tax, estimates are needed for the costs and revenues for each property before a calculation can be made of the available economic rent to be captured by the royalty.

C. Income Taxation

When the accounts of a mineral enterprise can be relied upon to accurately reflect the private costs and revenues of its operation, then a tax levied on the firm's net income has a number of advantages over other forms of taxation. A tax based on income or profits will avoid the problem of having to estimate the costs of extraction and the price of the output before the period of production as would be necessary if a variable royalty were levied. The income
tax also eliminates the problem of high grading since there will always be an incentive (when the firm is operating competitively) to use the poorer grades of ore up to the point where the marginal cost of production equals the price of output.

When a mineral body is being developed by a corporation, which is a foreign affiliate of a multinational corporation, then the tax policies of the country of the parent corporation will be an important factor in determining the attractiveness of the income tax on mineral production in the foreign country. For example, affiliates of the U.S. parent corporations are allowed to use income taxes paid to foreign countries as tax credits against the United States tax liabilities that are due on this foreign earned income.  

The United States foreign tax credit is limited to the amount of the U.S. tax liability on the foreign income alone. There are two ways to calculate the limitation on the amount of foreign tax credits that can be used to offset the United States tax liability on this foreign earned income. First, there is the per-country limitation when a separate computation is made of the United States tax liability and the available tax credits for each country where income is earned. Alternatively, the taxpayer may make an irrevocable election to use the overall limitation method under which the United States taxable income (and losses) from all foreign sources are pooled, as are all foreign taxes. One aggregate computation of the United States tax liability is then performed using this pooled data. Under both types of limitation, creditable foreign taxes in excess of the limitation may be carried back for two years or forward up to five years and added to creditable taxes in a year in which there is a shortage.  

By being able to credit foreign taxes against the home country's income taxes, a multinational corporation can pay income taxes to foreign countries up to the level of home country income taxes due on this income without increasing the total world-wide tax burden of the multinational corporations. The home countries of most multinational mineral corporations have allowed a wide range of taxes to be used as creditable foreign incomes taxes. In the case of U.S. oil companies operating in the Middle East, the taxes paid to these countries are allowed as foreign tax credits to offset the
United States income tax liability on the foreign income even though the foreign taxes are calculated on artificially constructed "incomes" which have little or no relationship to the true profitability of the foreign affiliates.

Because of the overall limitation method of calculating available foreign tax credits, any foreign tax credits from one country in excess of the home country's income tax liability can be used to offset any home income taxes due on foreign earned income from another foreign country. Typically an international mining or petroleum company pays large enough amounts of creditable but unavoidable foreign income taxes (which are often in reality royalties) to have an overall excess of foreign tax credits. In these circumstances, the multinational firm has an incentive to transfer profits from countries where their affiliates are facing a high marginal tax rate to either tax haven countries or to areas with a low marginal tax rate. For the international petroleum industry, it can be shown that in most foreign producing countries, while the average tax rate on income from crude oil production is substantial, the marginal tax rate is zero. This occurs because the income taxes in these countries are calculated as an amount per barrel of crude oil produced, not on the amount of true economic profits generated by the production. Therefore, these petroleum companies have had an incentive—one which they have acted upon—to transfer taxable income from their downstream activities located in the consuming countries to the producing countries. In this way they can decrease income taxes paid to consuming countries such as Canada, Europe, and Japan, where the income tax varies with recorded profits, and yet not increase taxes paid to the producing countries.  

This transfer of income between affiliates is facilitated by the integrated nature of mining and petroleum corporations. The vertical integration of activities often extends from primary production through the transportation sector to the final sale of the product. This leads to a situation where there is an absence of market prices for many of the products traded between affiliates; hence shifting taxable income between countries by transfer pricing is easy to execute.
In order for a country to stop these transfers of taxable income, it must estimate the correct values of the costs and revenues for each firm. The problems that tax authorities would have in constantly monitoring and correcting the accounting data for a set of mining and petroleum corporations are difficult to exaggerate. Before a government embarks on a policy of taxing the mineral industries by a tightly controlled income tax system it should compare the economic loss that is created by the administrative costs of enforcing such a scheme with the economic inefficiency of other methods of mineral taxation.

D. **Equity Participation by Governments in Mineral Enterprises.**

In recent years there has been a trend for governments of mineral producing areas to insist upon owning a part of the equity of the mining or petroleum enterprises operating within their jurisdiction. Faber has outlined some of the schemes through which governments have obtained a share of the equity of firms for amounts less than the normal market prices of the stocks. We can view the profits which accrue to the government's shares obtained in this manner partly as a profits tax on the income generated by the private sectors' investments.

Equity participation has been seen by some governments as a way to monitor the activities of the mineral enterprises, to insure that citizens of the country receive training in the operation of the firm, and to collect revenue from the mineral production. While this approach may be very advantageous for a country planning to eventually take over the operations of the firm, there are some serious drawbacks inherent in minority equity participation agreements.

Unless there is a very close surveillance of the prices used in the accounting of inter-affiliate transactions, the minority shareholder (here the government) may find itself receiving less than its share of the total income generated by the enterprise. The Middle East countries with participation agreements for petroleum production have reduced the incentive for the international petroleum companies to transfer income out of their ventures by contracting for their portion of the "profits" of the activity in terms of a fraction of the barrels of oil produced rather than a percentage of accounting profits.
Although equity participation has sometimes been thought of as a way in which a government can effectively control foreign operated enterprises, it can easily become just another expensive way to collect an income tax.

Michael Faber, in his summary of the factors affecting government revenue, points out that the transnational mining companies operating in the Commonwealth African countries, "prefer high tax rates, or excess profits taxes or supplementary mining taxes, or equity participation to devices such as increased royalties or export taxes . . . ." The inefficiency of high grading caused by a fixed royalty or export tax is no doubt a factor in determining the preferences expressed by these corporations. However, the relative difficulty of avoiding the payment of royalties and export taxes as compared to the other tax schemes is likely to have played a major role in determining the transnational mining companies' preferences.

E. Resource Rent Tax.

This tax system, proposed by Garnaut and Ross, is essentially an income tax applied to the mineral extraction sector which has a zero rate up to the point where a threshold rate of return is being earned on the investment and a very high marginal tax rate on income in excess of the threshold rate of return. As a tax based on accounting profits, it has all the advantages as well as the drawbacks of the income tax discussed previously. However, this tax would provide a much larger incentive for corporations to shift income into tax haven countries or engage in wasteful practices than would an ordinary corporation income tax designed to collect the same amount of revenue.

To illustrate, assume that presently a mining corporation with 100 percent equity is earning a gross of tax rate of return on its investment of 20 percent and is paying a corporation income tax of 40 percent. In this situation, the corporation earns a net of tax rate of return of 12 percent and pays corporation income taxes each year equal to 8 percent of the value of the investment. Now let us assume that the threshold rate of return allowed by the resource rent tax is 10 percent and the government wishes to again collect an amount of revenue equal to 8 percent of the value of the investment. To do this it will have to set a marginal income tax rate equal to 80 percent on the resource rent tax base in order to collect the same amount of tax revenue as with the ordinary corporation income tax of 40 percent.
In this example, the incentive to avoid taxation by transferring taxable income out of the country has doubled. Alternatively, the management of the corporation may find it worthwhile to decrease profits by superfluous business expenses which they enjoy as a substitute to earning profits, since now the government will bear 80 percent of these additional expenses through reduced tax revenues.

While this tax system attempts to allow for a normal rate of return on investment and then to tax only the excess profits, there are serious difficulties in determining what is the relevant investment base on which to apply the threshold rate of return. In order for a mineral enterprise to survive through time, it must either engage in exploration and development expenditures or purchase proven ore bodies or reserves. If it does its own exploration and development work, then for every successful mine there will be also be many failures. Garnaut and Ross would not allow these expenses to be included in the investment base of an operating mine but suggested raising the threshold rate of return of all successful mines. Increasing the threshold rate of return for the mineral extraction sector does not change the basic problem: if mining companies engage in unsuccessful exploration activities the government does not share in these expenses, while at the same time it may be taxing the existing operating mines on their "excess" profits.

The reaction of a mining industry to this set of tax incentives will likely be to divide its operations into two parts, an exploration and development sector and a mineral extraction sector. If the exploration and development sector is taxed under a normal corporation income taxation system, it will expense or depreciate its costs and sell its proven properties to the mineral extraction branch. The fair market price of these properties will already have capitalized into them any of the economic rents that exist. Thus, the exploration and development sector will be taxed on its profits which includes the economic rents by a corporate income or capital gains tax system while the mineral extraction sector will be taxed by the resource rent tax. The governments' problem of taxing economic rents in the mineral extraction industry will now be solved as no economic rents will now exist there to be taxed under the resource rent tax system.
The difficulty of determining what is the relevant investment base on which to calculate the threshold rate of return is aggravated by the existence of working capital. While Garnaut and Ross say that they would not allow "idle funds" as part of the investment base, nevertheless any mine operating as a going concern must have a significant amount of working capital which may at various times include securities as well as cash and inventories. Depending on the investment plans and payments structure of the firm, these different kinds of working capital are unlikely to remain in a constant proportion to the fixed capital stock.

A novel feature of the resource rent tax as designed by Garnaut and Ross is that it would allow for a complete recapture of the present value of the invested capital of the firm before the government would begin receiving any tax revenues. In most cases, this would entail a wait of five years or longer before any tax revenues are collected. Few governments could politically afford to give what would appear to be a tax holiday for such a period of time.

Any tax system applied to the mineral industries will only be as efficient in its capture of economic rents and in avoiding the creation of economic distortions as is the quality of information available to the tax authorities. The same type of information is required to successfully implement the resource rent tax as is needed for most income tax or variable royalty systems. While the resource rent tax designed by Garnaut and Ross is an interesting attempt to construct a tax system which has a minimum influence on the riskiness of a mineral extraction project, the economic distortions that it would create with its very high marginal income tax rates and administrative complexity make it an undesirable way of taxing the mineral industries in most situations.
Footnotes


