PART II : THE FISCAL REGIME
by Mike Faber

I

The problem confronting developing country governments in the now normal situation where all mineral rights are vested in the State can be posed like this:-

How are large sums of external capital to be obtained such as are now required for the opening up of a major mineral deposit, while at the same time the government is assured that, once the mine is developed and in operation, a fair and full price is acquired for the value of the ore being extracted? (The matching problem on the side of the operating and investing institutions is this:- how can the operators and investors, after sinking what may be hundreds of millions of dollars over a period of years in the discovery, development and construction of a mine in a foreign jurisdiction be assured that they will be able to earn and repatriate a full and fair return on the capital and effort invested, taking account of the risks they have taken?). The situation is made more difficult by two additional factors. First, it is normally impossible to decide with any accuracy in advance of actual mining operations what the size, profitability and value of any ore body is eventually going to turn out to be. Second, it is now almost invariable practice for major foreign investors to want to assure themselves of what the lease, royalty, tax and foreign exchange arrangements are going to be during the whole potential life of the mine, before even a detailed "development of the ore body" is undertaken. These factors together produce a situation where a major agreement (or set of agreements) needs to be negotiated and concluded between the host government, the operating company, and the financing institutions while knowledge of the extent and value of the actual ore body to be mined is still at a very primitive stage.

The issues to be determined in such agreements are of course multiple, and some of them are treated in other sections of these essays. This section deals only with the issue of arriving at an appropriate charge for the alienation of the ore body, and for simplicity's sake that charge will be referred to as 'the royalty' although it may be levied in many different forms and may be designated by many different names.

An appropriate formula must relate the charge to the value of the ore body, which in turn is a function of the stream of profit that stands to be derived from the mining of that ore body and the extraction from it of valuable metals or stones. This would seem to suggest that the royalty charge should be solely related to the profitability of working a particular section of an ore body at a particular time, as mining companies themselves tend to urge, and there has indeed been an increasing tendency for royalty formulae to be related to profitability. A strictly rigid application of the Ricardian theory of rent would in fact imply that the royalty on the most marginal part of the ore body would be zero, while that on the most profitable parts would be sufficiently large to reduce the profitability of working such an area to a 'normal' level. The logical application of this theory would thus be a royalty exactly equal in any time period to the excess of profit in that period over a designated rate of return. The designated rate of return would itself be determined by a judgment of the level of activity required to be expended in the national interest on prospecting, exploration, and mine development. Again speaking in theoretical terms only, such arrangements could be shown to procure for the host government the maximum royalty receipts consistent with a desired level of feasible mining activity.

In practice, a royalty design of this type has to be tempered by several practical considerations. First, it is not sensible to attempt to siphon off for Government (or any other owner of the mineral rights) all the excess revenue above the designated rate of return, since to do so is to sap the incentive of the mine operators to mine efficiently. If the royalty is to be based upon profit, some significant share of the marginal revenue must be left to benefit the operator. Second, it is to be doubted whether a royalty defined solely in terms of current profitability should be accepted, in view of the many assumptions and conventions that have to be adopted to arrive at any measure of profit - particularly in relation to depletion and depreciation allowances - which must have the effect of allowing the extent of 'profitability' to be somewhat within the operator's own control. Third, it is not necessarily right for the owner of mineral rights to waive all claim to royalties on ore being extracted, even if the operation is not making a profit in a particular year. It may frequently be the case that the metal in the ore has a value or a potential future value that the owners should still be compensated for. Fourth, it is an observable feature of resource projects everywhere that if pre-tax profits are exceptionally high, costs in one form or another will start to rise quite rapidly to meet them. If the royalty is taken in the form of a minerals tax based upon profit, assessed and collected after the profit has been determined, there is a danger that it will be <u>other</u> costs that will rise to absorb the profits - other than the royalty, that is. All costs - not just flat-rate royalties - influence the determination of what is "ore", and therefore the size of an "ore body". It would be ironic indeed if the abandonment of royalties based upon tonnages or value in order to maximize the size of the ore body was to lead indirectly to other cost increases that would not only diminish it again, but reduce the proportion of its value that would ultimately accrue to the owner of the mineral rights.

A way around this dilemma, again theoretical, would be to value the mineral in the ground, and then to levy a fixed annual charge based upon this. With such a charge, efficient firms would prosper and expand and inefficient firms would suffer and close, and everything payable would be extracted from the ore body because the <u>marginal</u> cost of production would not be affected by a <u>fixed</u> annual rent (or royalty). But that brings us back to the problem of valuing the mineral in the ground before mining starts. Procedures for doing this are both very costly and very imperfect. Relatively simple ways of putting a value on the ore body do however exist - for instance by auction or by putting the mining rights out to competitive tender. Such methods will yield a market price at the particular time the auction or tender occurs. But whether, <u>ex post facto</u>, this will turn out to be an appropriate price is another matter. The chances are that it will be a wrong price - too low for "goers", and too high for failures, and that even the average of all auction or tender prices will be too low, because of the substantial risk factor that will be attached for each individual bidder. The dilemma thus remains.

II

In the last ten years developing country governments - and for that matter the Provinces of Canada and the States of Australia - have tried a variety of devices whose purpose has been to reconcile the attainment of the maximum feasible share of the surplus from mining activities with the maintenance of reasonable incentives for continued exploration and investment.

The nearest approximation to the Ricardian hypothesis (that all the 'rent' element in the surplus will accrue to the owner of the mineral rights) has perhaps been attempted in legislation passed or agreements concluded in Botswana, Papua New Guinea, and Zambia. But there are other instances of "progressive" regimes that are worthy of attention as well.

In particular the regimes in force in Lesotho and in the Republic of South Africa are of interest. Lesotho, as an African Commonwealth country, falls directly within the scope of this Survey. The South African system of leasing and tax charges is however also of considerable importance, since many of the companies mining elsewhere in African Commonwealth nations are subsidiaries or affiliates of South African based mining companies.

The Botswana arrangements as they relate to the Selebi-Pikwe copper nickel deposits and to the 1970 and 1972 De Beers (diamond) agreements will be described briefly hereafter. These arrangements approached, without yet giving full effect to, the government's pronounced policy that the State, as owner of the country's mineral resources, ought to have the right both to determine the initial price at which it would sell those resources to a mining company and to adjust that price as circumstances changed. The method of adjustment, as provided for in the Mines and Minerals Act, was to be through a varying royalty on mineral sales. The principle underlying any adjustment would be this:- that the mining company would be allowed what the government considered to be a fair return on its investment after taking into account all the other elements in the lease terms and the fiscal regime and other factors, such as inflation. In other words, the mining company concerned was to be allowed a "fair return" on its investment, and the State were to acquire the whole of the rest of the surplus (less tax) as the price charged for the ores being extracted. A corollary of these arrangements may be that, should the rate of return fall below the "fair" rate, the company will be entitled to a "negative royalty" to bring it up to such a rate. In such a regime it could almost be said that the mining company concerned is acting as extracting and marketing agent for the Government, for a fee fixed in relation to its capital investment. No details of any such scheme are available for publication, but it is known that the later agreements between the Government of Botswana and De Beers, concluded in 1975, for the Orapa Expansion and DK1/2 Development, give effect to very much these principles.

It cannot be anticipated that the variable royalty and the rate of return in the mining enterprise limited to what the government unilaterally considers to be a "fair return on investment" will be concepts of wide appeal to mining companies undertaking investment in exploration or the development of large and possibly risky projects. Most professional opinion would consider these inducements impractical in circumstances where the opening up of a major new mine was under consideration. But when the expansion of what may be regarded as a singularly rich existing enterprise is being negotiated, the circumstances are somewhat different. In this respect, it is significant that the most perfect example of a neo-Ricardian solution was attained when a company, in order to expand an existing mine and to open up a new one in an adjacent area where the existence and extent of the mineral wealth was well established and risk of unprofitability was negligible, found itself forced to renegotiate a set of existing arrangements. If this analysis is correct, the 1975 Botswana-De Beers Agreements may come to be looked upon in retrospect as a "one-off" achievement where an LDC Government very successfully took advantage of a set of exceptionally favourable circumstances.

Less rigid and severe - but equally interesting and possibly more practical - arrangements for assuring to Governments a major share of the surpluses derived from mining activities are to be found in agreements recently concluded between the Government of Papua New Guine and major mining enterprises. The country's Prime Minister has stated that his government's mineral policy would adhere to two principles: one, that the foreign investor in resource projects should be allowed a reasonable return on his investment, and two, that the "lion's share" of profits above that level should belong to the people of the country. Two distinct agreements, one the renegotiated agreement of 1974 with Bougainville Copper Limited covering the actual working of the Bougainville mine, and the other the agreement of 1975 with Dampier Mining Company Limited (a wholly owned subsidiary of The Broken Hill Proprietary Company Limited) intended to define the fiscal and financial conditions under which the Ok Tedi deposit (also, like Bougainville, a copper and gold deposit) might be exploited, give effect to these principles.

The Papua New Guinea Government's share of the surplus from Bougainville Copper may be said to be comprised of five elements. They are

(i) a royalty fixed at $1\frac{1}{4}$ per cent of the value of sales;

(ii) the normal company income tax, currently at the rate of 33 1/3 per cent;

(iii) an additional profits tax at a rate of 70 per cent which "kicks in" whenever profits net of company income tax exceed a rate of return exceeding 15 per cent of capital employed;

(iv) a 20 per cent interest in the equity of the company, which was purchased, but on concessionary terms; and

(v) a 15 per cent dividend withholding tax on all dividends paid to shareholders outside Papua New Guinea.

The royalty element is straightforward. Taxable income is arrived at without the benefit of either a depletion allowance or of concessionary capital allowances. Originally the Government was granted an option to take up a 20 per cent shareholding. By the time it came to exercise that option the market value of the shares was about three times the price that the Government had to pay for them, so that - crudely - one might say that two thirds of the Government's dividend receipts represent a form of payment for the company's right to mine. The remaining shareholders are preponderantly resident outside Papua New Guinea and dividends distributed to them are liable to dividend withholding tax.

The regime of imposts, taken as a whole, is progressive in respect of taxable income, except at very low rates of profit when the royalty element becomes predominant. Consequently the government's share of pre-royalty and pre-tax profits can, in theory, vary between about 50 and 75 per cent. In fact the latter figure is unlikely to be realised since, to reach it, a profit would be required almost twice as large as those realised in 1973 and 1974, when copper, gold and silver prices were generally strong. Had the present fiscal regime been in force for the whole of 1973 and 1974, it would have procured for the Papua New Guinea Government about 65 per cent of the surplus.

With regard to the impact of this regime upon high marginal profits, the interpretation of what "the lion's share" means in practice is reasonably clear. The royalty element will comprise about 2 per cent, company income tax and additional profits tax will comprise 70 per cent, the concessionary element in the government's receipt of dividends from its own shareholding will comprise some 3 per cent, and the dividend withholding tax on dividends being sent abroad will also comprise about 3 per cent. Taken together these imposts imply that the marginal rate of "take" once a return of 15 per cent on the company's capital has been exceeded totals about 78 per cent. It would seem fair to speculate that the residual 22 per cent, at the margin, which is what the remaining non-governmental shareholders are entitled to, represents what the originators of the formulae would regard as a minimum acceptable inducement for efficiency in current operations, and expansion of future operations.

The Ok Tedi agreement prescribes the fiscal regime that will come into effect if the mine is developed by Dampier. There are both similarities and differences compared with the Bougainville formula, but the same basic principles are observed. During the investment recovery period, income taxation will be limited to the prevailing general rate of company income tax or 35 per cent, whichever is the less. After the investment recovery period, the company will be required to pay a marginal rate of 70 per cent tax (comprising the normal company income tax plus an additional profits tax) on income accruing in any one year in excess of such income as would give a 20 per cent internal rate of return on the project.[1] Adjustments in exchange rates between the American dollar and the PNG kina are allowed for. The royalty and dividend withholding tax provisions are broadly similar to those prevailing for Bougainville. Provision is also made for the State to participate to the extent of 20 per cent in the equity of the company, with complicated arrangements being agreed as to the extent credit against calls for payment for this equity is to be allowed for work already done.

The Zambian Mineral Tax Act, 1970, also relates the rate of tax payable to some indicator of the rate of return on investment. New mines pay no tax until the original capitalisation and subsequent expenditures have been recovered. Beyond that, when it can be shown that the average after-tax return on equity over a period of three years is less than 12 per cent, the Mineral Tax Act provides for the remission of part or all of the mineral tax paid. This provision operates only for "new" mines, and only the mineral tax not the ordinary income tax may be remitted. Refunds thus obtained are not liable to income tax. The effect of these arrangements is twofold:

(1) for new mines the mineral tax acts as a royalty which only comes into effect when total capitalisation has been recovered and the average rate of return on the investment exceeds 12 per cent;

(2) taking mineral tax and income tax together, a sliding scale in the combined rates is established ranging, for copper mines, from a minimum of 22.05 per cent when

all mineral tax is refunded to a maximum of 73.05 per cent when no mineral tax is refunded. Because the mineral tax on lead and zinc is only 20 per cent, as opposed to 51 per cent on copper, the range of combined tax rates on new lead and zinc mines would be smaller, from a minimum of 36 per cent to a maximum of 56 per cent.

Other royalties, taxes, or duties which are progressive in relation to some measure of profitability will later be noted in the legislative provisions of Ghana and Uganda. A technically interesting system of mine leasing and taxation is in effect in South Africa for the mining of gold and precious stones. Essentially there is a two-tier charge for gold mines (consisting of lease and income tax plus surcharge) and a three-tier charge for diamond mines (consisting of export duty, lease, and income tax plus surcharge). For gold mining, both the rates set in the lease and the applicable rates of income tax are determined by sliding scale formulae which are progressive with respect to profitability, where 'profitability' is defined as profit divided by revenue expressed as a percentage. For diamond mining, only the lease consideration is progressive in respect of profitability. The income tax is a fixed percentage (at the time of writing 45 per cent), the surcharge (10 per cent) and loan levy (also 10 per cent) are fixed in relation to the income tax, making a total of 54 per cent of taxable income, and an export duty of 15 per cent is also payable on the value of all rough and uncut diamonds exported.

Leaving aside for the moment the effect of capital allowances, which are exceptionally liberal, the share of the take that the Government of South Africa would stand to get from the mining of deposits held in the name of the state is theoretically very high and would in practice be very high if we were able to assume the existence of a gold or diamond mine with high profitability where very little capital expenditure was taking place.

Essentially the lease consideration (or royalty) payable to the state for the mining of precious metals and other minerals, such as uranium, produced in conjunction therewith is given by the formula

$$y = a - \frac{6a}{x} \qquad \text{or} \qquad y = a - \frac{8a}{x}$$

where 'y' is the percentage of profits payable to the state as royalty and 'x' is the ratio of profit divided by revenue, expressed as a percentage.

The income tax payable on gold and uranium mining is also based on a sliding scale formula

$$y = 60 - \frac{360}{x}$$

or, for gold mines established after 17 August 1966,

$$y = 60 - \frac{480}{x}$$

where 'x' has the same meaning as above, and 'y' is the percentage of profit payable as income tax. Lease consideration or royalty payable to the State is deductible for tax purposes. A 5 per cent surcharge is added to the income tax of all gold mines, plus a further 5 per cent loan levy calculated before the addition of the 5 per cent surcharge.

It should be mentioned that a more lenient formula is applied to small gold mine operators (i.e. those with a taxable income below R 150,000), and financial assistance is afforded to certain gold mines which would otherwise be in danger of closing down because of rising costs.

The impact of the royalty (or lease consideration) taken in conjunction with the income tax clearly depends upon the value ascribed to 'a' in the lease formula, and the actual profitability of the mine as expressed by 'x'. The actual values ascribed to 'a' have in the past ranged from 10 to 30. In determining the magnitude of "a" cognizance is taken of the indicated return on the capital invested. In the years before inflation became endemic, a return of 10 percent to 15 per cent compound interest was considered as a reasonable return, bearing in mind the risks involved in mining ventures.

The table overleaf displays, for values of "a" between 10 and 30 and for values of 'x' between 6 and 60, the different proportions of profit that will be payable to the State as royalty, income tax, surcharge, and loan levy. But in interpreting the figure it does have to be remembered that 'profit' for the purpose of determining these levies may have been reduced considerably below normal or 'accounting' profit by the application of the liberal allowances for capital expenditure.

The following points are also of relevance:-

1. The lease formulae applicable to individual mines are published.[2]

2. The value of 'a' has over the years varied from 10 - 32. Over the last two decades the value of "a" has been of the order of 15.

3. The highest value of 'x' achieved to date is of the order of 80 per cent.
(NB:- A value of 'a' of 15 combined with a value of 'x' of 80 would give a theoretical government take of 64 per cent, which would be supplemented by a 2.4 per cent compulsory loan.)

4. For the purpose of calculating the indicated return on capital invested, capital is taken to include loans and the interest and other charges payable in respect thereof as well as equity. The ratio between loan capital and equity varies considerably.

5. The return on capital invested is based on the discounted cash flow of distributable profits that will accrue to the mining company after the payment of lease and tax to the State. Allowance is made for cost and price escalation.

6. Revenue is gross revenue derived from the working of the lease area including revenue from uranium and sundry sources such as the sale of crushed stone etc.

7. All gold mines established after the 23 February 1946 are allowed to write-off all redeemable capital expenditure before becoming liable for lease or tax payments.

8. The 15 per cent export duty on diamonds sold is deducted from gross revenue and the profit upon which lease payments are calculated is reduced accordingly. The percentage of diamonds exported in the rough and uncut form is not published.

9. The sliding scale formulae were designed to encourage the mining of low grade ore.

GOVERNMENT TAKE AS % OF PROFITS FROM GOLD MINING IN SOUTH AFRICA

values of 'x'	ROYALTY (%) (values of 'a') 10	15	20	25	30	rate of income tax (%)	including surcharge (%)	GOVERNMENT TAKE (%) from royalties and income taxes (values of 'a') 10	15	20	25	30	compulsory loan	GOVERNMENT TAKE (%) including compulsory loan (values of 'a') 10	15	20	25	30
6	0	0	0	0	0	0	0	0	0	0	0	0	equivalent to the 5% surcharge on I.T.	0	0	0	0	0
10	4	6	8	10	12	24	25.2	28.2	29.7	31.2	32.7	34.2		29.3	30.8	32.3	33.8	35.2
15	6	9	12	15	18	36	37.8	41.5	43.4	45.3	47.1	49.0		42.8	44.7	46.5	48.3	50.1
20	7	10.5	14	17.5	21	42	44.1	48.0	50.0	51.9	53.9	55.8		50.0	51.8	53.7	55.6	57.5
25	7.6	11.4	15.2	19	22.8	45.6	47.88	51.8	53.8	55.8	57.8	59.8		53.9	55.8	57.7	59.6	61.5
30	8	12	16	20	24	48	50.4	54.4	56.4	58.3	60.3	62.3		56.6	58.5	60.4	62.2	64.1
40	8.5	12.75	17	21.25	25.5	51	53.55	57.5	59.5	61.4	63.4	65.4		59.8	61.7	63.6	65.4	67.3
50	8.8	13.2	17.6	22	26.4	52.8	55.44	59.4	61.3	63.3	65.2	67.2		61.8	63.6	65.5	67.3	69.1
60	9	13.5	18	22.5	27	54	56.7	60.6	62.5	64.5	66.4	68.4		63.0	64.9	66.7	68.5	70.4
	assumes formula $y = a - \frac{6a}{x}$					assumes formula $y = 60 - \frac{360}{x}$ + 5% surcharge												

It is instructive to compare the table showing the potential share of the South African Government's take from gold mining, as displayed in the preceding table, with the actual percentages that lease and tax liability bore to profits in a recent financial year for a number of the country's leading gold mines. These percentages are shown in the list that follows.[3]

Name of Mine	Lease and tax liability in last financial year expressed as percentage of profits
Western Holdings	63.4
Free State Geduld	63
Bracken	62
West Driefontein	61
Doornfontein	60
St. Helena	60
Leslie	58
Blyrooruitzicht	56
Winkelhaak	56
Grootvlei	55
Marievale Consolidated	54
Stilfontein	54
Welkom	54
President Brand	53
Western Deep Levels	52
Buffelsfontein	52
Libanon	51
President Steyn	50
Venterspost	50
East Daggafontein	49
Harmony	47
Vlakfontein	45
S.A. Land & Exploration	43
Hartebeestfontein	20
Kinross	13
Kloof	10
West Rand Consolidated	5
East Rand Proprietary	1.3

Source: Quarterly Review of South African Gold Shares.

The Government take from diamond mining in South Africa and in Namibia is more difficult to compute. In terms of the Diamond Export Duty Act (1957), an export duty of 15 per cent is payable on the value of all rough and uncut diamonds. The existence of such a duty makes it theoretically possible for the take to go up to or exceed 100 per cent of profits, but that would only happen if profits were less than 15 per cent of the value of such exports. In practice this is very unlikely. But the combination of an export duty of this type with a fixed percentage rate of tax and a lease formula that is only mildly progressive almost certainly means that the share of government take (although not the absolute amount) actually declines with profitability.

Diamond royalties are computed on the basis of

$y = 15 - \frac{120}{x}$, in the case of most alluvial or fissure workings,

and $y = 20 - \frac{160}{x}$, in the case of diamond mines (pipes)

Solving this second formula for different values of 'x' we find

when x =	10	20	30	40	50	60	80
then y =	4%	12%	14.7%	16%	16.8%	17.3%	18%

('x' again stands for the ratio of profits to revenue expressed as a percentage, and 'y' for the lease consideration or royalty to be levied upon assessable income for tax purposes.)

The lease charge is thus relatively insensitive to the rate of profit, but will almost certainly fall within the range of 16 per cent + or - 2 per cent.

Income tax on diamond mining is levied at the rate of 45 per cent, plus a 10 per cent surcharge and a 10 per cent loan levy. The effective rate of income tax is therefore 49.5 per cent.

Putting together the three charges - export duty, royalty, and income tax including surcharge - it is found that over the most likely range of profitability the theoretical government take will vary between 63 per cent and 65 per cent. On top of that will be levied the compulsory loan constituting a further 3.5 per cent of profits, but this will be repayable after seven years with 5 per cent tax free interest. The 'actual' government take will be reduced below the 'theoretical' government take by the extent to which liberal capital allowances reduce taxable income below the income that would be shown were all capital assets to be written off over their expected working life.

For base metals, including lead and zinc, the South African lease and tax rates are generally below those shown for gold and uranium, or for diamonds. For base minerals on state land or alienated state land, the Government normally accepts a lease consideration of about 10 per cent of profits before tax is deducted. Income tax for base mineral companies is 40 per cent of taxable income, plus a surcharge of 2½ per cent thereof, bringing the total to 41 per cent of taxable income. The theoretical government take from lease, royalties and income tax (with surcharge) is thus around 46.9 per cent of profits, with an additional loan levy of 5 per cent of the income tax payable, which levy is repaid at a date decided on by the Minister of Finance, the period not to exceed seven years. Simple interest on this amount accrues at the rate of 5 per cent per annum.

A somewhat similar concept, involving a higher proportion of net proceeds accruing to the owner of the mineral rights at exceptional levels of profitability, is embodied in the agreement concluded between the Government of Lesotho and De Beers for the opening of the Letseng-la-Terai diamond mine in the Maluti mountains. In contrast to the Botswana diamond mine, where the grade is high and the value per carat is low, the very low grade of the Lesotho pipe is expected to be compensated by a small percentage of large stones of high quality. The agreement provides in effect for the Lesotho Government to receive 62½ per cent of profits after the recovery of capital invested, and that if the mine proves to be substantially more profitable than anticipated Government's percentage of profits could rise on a sliding scale to a maximum of 72 per cent. De Beers have commented that they regard this percentage as "unquestionably high" but reasonable "bearing in mind that De Beers itself did not make the discovery nor bear the substantial costs of the original prospecting programme".[4]

Many of these divergent formulae can best be regarded as attempts to resolve a single technical problem. That problem is how to combine levies of normal severity on mining activities of average profitability with very high proportionate levies on mines of exceptional profitability <u>without</u> introducing a marginal rate of charge that is so steep that it is likely to reduce the company's incentive to operate with maximum efficiency. This is a problem of quite a different nature to the issue of whether or not a particular fiscal and royalty regime operates to encourage or discourage expansion of existing mines and exploration for new ones. The problem can be illustrated with a simple example.

EXAMPLE TO ILLUSTRATE EFFECT OF PRODUCT PRICE CHANGE ON "REQUIRED" ROYALTY AND TAX RATES

1.	Capitalization			100
2.	"reasonable rate of return" [a] (post-tax)		say	15%
3.	Normal position:			
	Assume sales revenue of	130		
	Operating and other costs	100		
	Pre-royalty and pre-tax profit	30		
	Royalties and taxes (at 50%)	15		
	Post-tax profit	15		
	∴ return on capitalization		=	15%
4.	Assume sales revenues double	260		
	Operating and other costs remain	100		
	Pre-royalty and pre-tax profit	160		
	(a) If post-tax profits are to be allowed to double, but to rise no more than that, royalties and taxes will need to be	130		
	(b) Marginal rate of Government take would then require to be 115 ÷ 130	= 88%		
	Leaving a marginal rate of retentions for the company of	12%		
5.	Under these assumptions, lower marginal rates of Government take will allow company profits to more than double, e.g.			
	(a) If marginal rate is	80%		
	Company's post-tax profits	= 41		
	and return on capitalization		=	41%
	(b) If marginal rate is	75%		
	Company's post-tax profits	= 47.5		
	and return on capitalization		=	47.5%

Footnote

(a) No inference should be drawn from this example that the author considers a "reasonable rate of return" (post-tax) to be 15 per cent. What is a "reasonable" rate in any situation will depend upon a wide variety of circumstances. The figure has been chosen for illustrative purposes only.

(c) If marginal rate is 70%
Company's post-tax profits = 54
and return on capitalization = 54%

The problem can now be restated in these terms. In theory the increased revenues shown in the illustration, assuming that they arise from a wind-fall doubling of the product price, belong to rent. But by extracting the royalty (rent) as a profits tax, either the marginal rate has to be excessively high; or a substantial component of what should be extracted by the ore-owner as rent gets left with the mine-operator as greatly increased post-royalty and post-tax profit.

The sections that follow examine a selection of the taxation and royalty arrangements that are in force in African Commonwealth countries. If they are to be judged - and no such judgement is attempted explicitly in these pages - it should be (we suggest) by reference to two criteria:-

1. Do the leasing, royalty, participation and taxation provisions jointly facilitate an optimum level of exploration, mine development and mining in the particular jurisdictions under consideration? and

2. Do such arrangements procure for the governments concerned the maximum possible share of the revenues from mining consistent with the objective defined above?

III

Governments raise revenue from mining activities in the countries under review[5] in ways that can usefully be distinguished under three main headings:-

(A) Imposts, such as rents, fees, licence charges etc., that are generally of a minor amount, and which can be looked upon primarily as payments for use of land or for an administrative service.[6]

(B) Imposts, such as royalties, or other forms of arrangement which represent payment by the mining company to the owners of the mineral rights for the right to extract, process and dispose of the ore.

(C) Imposts which take the form of regular taxation, such as income tax, company or corporation tax, withholding taxes etc., which are not special to mining enterprises in the particular country.

Unfortunately, from the point of view of exposition, actual arrangements in practice often cut across or obscure these three categories of imposts. Thus the rent on a mining lease is usually relatively small in comparison with the value of minerals won; but on occasions it is substantial and, in these instances, a portion of the rent may be regarded as assuming the nature of a royalty. (i.e. it does not only reflect the surface value of the land in alternative uses; it also comprises a part payment for the right to extract minerals).[7] Mineral taxes (or Mining Company taxes) may be chargeable on the assessable income of companies in the same manner as income taxes, but because they are only levied on mining companies they in fact constitute a form of (or a substitute for) mineral royalties.[8] Export taxes may also serve as a form of royalty in situations where virtually all the production of one particular mineral is exported.[9] Alternatively the orebody may be paid for by other means, such as the issue of equity to the owner of the mineral rights free or at a discount,[10] or by making available an option (should a profitable orebody be discovered) for the owner to take up shares at a favourable price,[11] or by making over at no cost a share of the production to the owner of the rights. Where Government is the owner of the mineral rights, arrangements of this kind may be negotiated at the same time as the conditions governing rents, royalties, tax rates, allowances and exchange control provisions. In the resultant sets of arrangements the distinction between the three types of charges, though conceptually simple, may not be reflected clearly in the financial flows. In particular, it may suit both host government and mining company to present what is in essence a royalty charge as an income tax, so as to take advantage of double taxation relief in another country.

Apart from these imposts there are a number of other taxes - of which the mineral rights tax[12] and the severance tax[13] are important examples - which may be special to mining enterprises. The possible uses of these taxes to influence the pace of exploration and of exploitation within a given jurisdiction are extremely interesting. But they are not in general use for revenue raising purposes in the countries under review. This may be largely because both the minerals right tax and severance taxes are of much greater relevance where the mineral rights themselves remain in private hands.

IV

Imposts of the first type (A) - the rents, fees, licence charges etc. are only of minor interest to us. Their normal range is indicated in Table One - one has to say 'normal' because the Minister or Chief Mines Officer usually has the right to designate an exceptional charge if he feels the circumstances warrant it.[14] From the revenue raising point of view it is the other forms of impost (B) and (C) that are of far greater importance.

V

Before discussing royalty arrangements in detail - including what we call 'quasi-royalties' it will be convenient to characterise and consider two attitudes towards royalties that are so distinct that they may be said to embody starkly contrasted approaches to the whole process of private sector mining. The point of contrast, and the issue at stake, involves any surplus above normal rates of return that may arise from the exploitation of a particular mineral deposit. To whom does that surplus rightly belong? Does it belong to those who have risked their capital in exploring for the deposit, finding it, and bringing the mine (or well) into production? Or does it belong to whomsoever can establish claim to the ownership of the particular mineral rights? Or, should the Government, if it is not itself the owner of the mineral rights, claim the major part of the value of the surplus (i.e. above what it would stand to receive by normal taxation) on behalf of the people of the country? Or should the surplus be divided between all three parties; and if so, according to what principles and in what proportions? Or is the issue not a moral one at all - even in the sphere of political philosophy - but one to be settled by bargaining strength and negotiations?

On one side of the argument, representatives of the mining companies are prone to argue that mineral resources - however rich - are valueless until they are discovered and extracted from the ground; that the exceptional 'riskiness' of mining justifies an above-normal return; that against any surplus achieved from the exploitation of one particular rich deposit have to be offset the expenditure on prospecting and the losses incurred in less successful operations; that the owner of the mineral rights will get a fair share through a royalty expressed as a fixed percentage of the value of output or even a fixed

TABLE ONE

FEES, RENTS AND LICENCE CHARGES

	Sierra Leone	Ghana	Nigeria	Kenya	Uganda	Tanzania	Zambia	Botswana	Lesotho	Swaziland
Fees - Miscellaneous Transactions (maximum payable)	20 Le	£75[n]	£40[o]	shs150[f]	375/-	100 shs			j	£ 2[p]
Licence Charges	15 Le				75/-[k] 150/-	40 shs 20 shs[g]			j	
Rents	20 Le[a]		£5.00[a]	shs2.50c[d]	300/-[a]	100 shs[a]		R2-R10[h]		£ 5[a]
	4 Le[b]		2.0s[b]		75/-[i]	10 shs[h]		R100[l]	j	£ 1[i]
	4 Le[e]		15.0s[c]		20/-[d]	1 shs - 2.50 shs[d]		R50p.mth[m]		5s[d]
	1-2Le[d]		6d-3.0[d]		75/-[e]					

TABLE ONE

NOTES

a. holder of an exclusive prospecting licence for every square mile or part thereof per annum.

b. holder of an exclusive prospecting licence for every square mile or part thereof per annum for lignite only.

c. holder of a mining right for every hundred yards or part thereof measured along the centre of the stream bed.

d. leases per acre or part thereof.

e. a waterright.

f. apart from an assay fee of Shs.500 per month for laboratory use.

g. for renewal of licence.

h. a claim.

i. a location.

j. fees and rents payable to the state are prescribed by the Mining Board in terms of Section 16 and 17 of the Mining Rights Act 1967.

k. fee is shillings 75/- for preparation of a prospecting licence and a location and a fee of shillings 150/- for a lease.

l. a mining claim for precious stones.

m. a mining claim for alluvial deposits.

n. on 1 January 1973 Nigeria changed over to the decimal currency system. The unit of currency is the Naira (₦) which is divided into 100 kobo (K). At that time One Naira was equivalent to 10 shillings sterling, and One Kobo to 1.2d. At current (July 1974) values, the Naira is worth ₦ 1.46 = £1 sterling.

o. The present unit of currency is the Cedi (C) divided into 100 pesewas (P). With effect from 7 February 1972 the new Cedi was revalued to US $ 0.78. At current (1 July 1974) values, the Cedi is worth C 2.71 = £1 sterling.

p. One old Swaziland £ was made equal to 2 Rand; and 1 s became equivalent to 10c.

percentage of profit; and that Government will get its due share through the normal taxation of company income and dividends.[15]

The other side of the argument is based upon an assertion that the intrinsic value of the orebody belongs to the owner of the mineral rights; that the company which mines the orebody is entitled to a normal return on its capital (which will vary upwards or downwards from the normal according to its comparative efficiency) but nothing more; that any additional surplus arising out of the working of the orebody due to its exceptional richness or other favourable natural features or from movements in mineral prices that create windfall profits properly belongs to the owners of the orebodies; and that the royalty (or other arrangements) should be so designed as to 'cream off' all such surpluses for the owners of the mineral rights.[16]

The proponents of one school, in a sentence, look upon the mining companies which find and work them as being the rightful owners of the richness of the orebodies; the proponents of the other look upon such companies as merely extractors and processors earning what amounts to a fee related to the work they do but with the value of the mineral products after meeting all discovery and extraction costs still belonging to those who owned the undiscovered ores.

The older Mining and Minerals Legislation in force usually reflects the first school of thought - i.e. it enshrines the concept of vested rights, it makes no provision for participation in equity, and it sets royalties generally at a low level as if mining itself was a welcome activity as a means of providing employment and of 'opening up the country'. The legislation itself often seems to be mainly concerned with bringing order into a situation where numerous prospectors are likely to be in dispute over the area of the claims that they have staked.[17] It is in part because of the discrepancy between this legislative framework and what developing country governments now regard as their proper rights that major new discoveries are nearly always embarked upon not in terms of the general enabling legislation, but according to the terms of special agreements which are individually negotiated (and periodically re-negotiated) between the host government and, characteristically, a transational mining enterprise.[18]

These special agreements approach much closer to the second school of thought that we have characterised. Indeed, in examining such agreements and comparing the terms that are negotiated in different countries at different times, it is possible to trace a process that is progressive and of major significance.[19] One interpretation of this process sees it as a manifestation of the increasing political self-consciousness and economic nationalism of the mineral-producing LDCs; i.e. as an expression of a growing determination to have greater control over the exploitation of their natural resources and of a similar determination to receive for the products of those resources the highest price that purchasers can be induced or forced to pay.[20] Another interpretation - and, in a sense, a complementary one - sees this process as part of the effort by the developing world as a whole to redress the unfavourable movement against them in the world's terms-of-trade by collectively forcing up the price of primary commodities in an era when demand for some of such commodities in the industrialised countries expands continuously while the world's supply is being depleted. Sometimes this collective action may take the form of joint and united action through a single organization. More often the movement is less ordered and coherent. One country with exceptional resources, exceptional determination, or a fortuitous position of strength holds out for exceptional terms and gets them. The details of this new arrangement become disseminated in time, and equivalent or even better terms are demanded in the next agreement that comes up for negotiation. In this way a sort of follow-my-leader process is established.[21]

The attitude of the large mining enterprises themselves towards this process can be observed. Initially they may threaten to leave (or not to start mining in) those countries which stiffen terms against them.[22] Some will do so; others will restructure their prospecting activities away from the countries which are considered 'unreliable' (in terms of their adherence to agreements) or too demanding (in terms of the conditions that they set) and towards countries which are considered more reasonable, amenable, or subject to developed country influence. This has happened.[23] But as the 'new' sets of developing country terms are more widely accepted and applied - and the process here can be observed to be spreading from the developing world to the more developed areas - viz. the State governments in Australia;[24] the Provincial governments in Canada[25] and the European governments in their attitude towards North Sea oil[26] - so the transnational companies condition and adjust themselves to what, in effect, are the higher prices that the mineral producers are demanding for their natural resources. Moreover, so long as all (or nearly all) the mineral producers behave in the same way so that all (or nearly all) the international mining companies are affected (more or less) equally - the latter will find that this process is likely to have only a temporarily adverse effect upon the level of their profits. A more immediate cause of awkwardness arises when one operator in a particular jurisdiction may obtain or may continue to enjoy exceptionally favourable terms, thus enabling him to undercut his international competitors and/or make their profit performance look poor by comparison with his own.

VI

Where governments own the mineral rights, and deliberately charge mining companies for the right to sell the ores which they have extracted, the charge is levied in the countries that we are considering in one (or more) of three ways, viz. (i) through a royalty, (ii) through a special mining tax, (iii) through government participation in the equity.[27]

There are many different ways of assessing a royalty charge, five of which are to be found in the Minerals Legislation of African Commonwealth countries. These are (a) a fixed amount per unit of output; (b) a fixed percentage of the value of output;(c) a variable amount per unit of output depending upon price (which can also be expressed as a variable percentage of value); (d) a variable percentage of value of the output depending upon some measure of the mine's profitability; and (e) a fixed or progressively variable percentage of profit.[28]

Royalties fixed in monetary terms per unit of output are normally only used for levying upon quarried materials or bulky minerals of relatively low value, and the charge itself is usually kept low (viz. 2.75 cents per ton of coal in Botswana; $1\frac{1}{2}$ d per ton on lignite in Nigeria; 3 d a ton on coal in Swaziland; 8 d a ton and 10 c a ton on chromite and ilmenite in Sierra Leone; and a whole range of charges in Tanzania from 30 cents (T) a ton on coal, 50 c per hundred cubic foot of sand or clay and 1 sh per hundred cubic foot of gravel and stone up to 6 sh a ton for salt and 150 sh a ton for meerschaum clay). Royalties of this kind have the advantage of being very simple to administer, but the owner of the mineral rights is likely to lose revenue at times of rising prices.

Royalties fixed as a percentage of value are by far the commonest form of royalty. They avoid, in part, the danger of revenue loss from price rises , but they suffer from other conceptual and practical disadvantages. The range of such fixed royalties in African Commonwealth countries spans from

$1\frac{1}{2}$ per cent to 10 per cent. It should be emphasized that these are the rates set in the ordinances or regulations, not those prevailing in special agreements; nor can it be assumed any minerals are mined that are actually liable to the royalties in the specific countries. Given these qualifications, the table overleaf shows the fixed percentage royalties payable on certain different mineral products in different Commonwealth African countries.

Royalties, where the percentage charge varies with the price of the metal, are in force in Nigeria. The most important royalty is that upon tin, which was revised downward in 1973 from a top marginal rate of 40 per cent of the value per ton of metallic tin to the present royalty, shown below, where the top marginal rate is 16 per cent.

Royalty per ton of metallic tin - Nigeria.

11% of the value up to	₦ 2,200 per ton, plus
12% of the additional value up to	₦ 2,400 per ton, plus
13% " "	₦ 2,600 per ton, plus
14% " "	₦ 2,800 per ton, plus
15% " "	₦ 3,000 per ton, plus
16% " "	₦ 3,200 per ton, and thereafter.

(Note: originally 2 Naire (₦) = £1 sterling
since April 1973 1 Naire (₦) = $ US 1.52)

For columbian ores, tungsten ores, zinc ores and gold, similar royalty formulae are laid down generally relating the percentage of value payable, progressively, to the prevailing price for the mineral.

An example of a royalty fixed as a constant percentage of profit for tax purposes (in this case 5 per cent) but defined as a royalty in the regulations is to be found in the Mineral Regulations of The Nortern Territories of the Gold Coast of 1937. The provision states "Every lessee of a mining lease shall be charged with the payment to His Majesty of the following royalty, namely, one shilling for every twenty shillings of the annual amount of all profits made from or in respect of the exercise of the rights conferred by such mining lease".

These royalties have been replaced by a straight 6% charge on gross value for gold and diamonds, but remain in force for bauxite and manganese. Both types of royalties are

TABLE TWO

ROYALTIES EXPRESSED AS A PERCENTAGE OF VALUE OF PRODUCTION

	Sierra Leone	Ghana	Nigeria	Ken-ya	Ugan-da	Tanz-ania	Zam-bia	Bots-wana	Les-otho	Swazi-land
Barytes			1½	d						
Coal, Lignite										
Kaolin						2½				
Mica			5			5				
Asbestos										2
Ilmenite (rutile)					)	)		)		)
Bauxite					)	)		)		)
Manganese					)	)		)		)
Tin			11 to 16[b]		)	)		)		)
Columbium	4-50[a]		4-50[a]		)5	)5		)3		) 2½
Lead			2[c]		)	)		)		)
Zinc			1-5[a]		)	)		)		)
Copper										)
Platinum	5		6		)5	5				)
Gold	9	6	4-10[a]		)	1½				)
Diamonds	5	6	10		10	15		10		)
Silver			6		5	1½				)
Tungsten			1-5[a]							
Thorium			4							
Zircon			4							

a. depending upon price per unit.

b. depending upon profit.

c. if the lead contains not less than 4 oz. of silver per ton there is an additional 3 per cent on the value of the silver.

d. as prescribed by the Minister from time to time by notice in the Gazette.

supplemented by a Minerals Duty, which is a variable charge based upon the profitability of the individual mining enterprise.

Royalties (or equivalent charges) which vary in percentage according to some measure of profitability are to be found in the Minerals Legislation of Ghana and Uganda, and are increasingly becoming a feature of special mineral agreements. The Ghana impost is described as 'a minerals duty' and measures profitability in relation to the value of minerals won (v), and the operational cost of production (c). The critical expression

$$\frac{v - c}{v}$$

is called 'the yield ratio' and the following table relates the yield ratio to the applicable rate of duty.

Yield Ratio	Rate of Duty
Up to 45%	10%
Over 45 and up to 60%	15%
Over 60 and up to 75%	20%
Over 75 and up to 100%	25%

The Uganda Fees and Royalties Act (Chapter 168) flatly stipulates: 'Notwithstanding the provisions of any mining lease, special mining lease, or any other law, royalties shall be computed on profits arrived at before the deduction of royalties for the purpose of computing income tax'. The royalty payable by Kilembe Mines (which mines copper and is the largest mining enterprise in the country) is calculated according to the following prescription:-

On that part of the profit which does not exceed 10% per annum of the capital employed in the business ...	Nil
On that part of the profit which exceeds 10% per annum of the capital employed in the business but does not exceed 20% ...	5%
On that part of the profit which exceeds 20% per annum of the capital employed in the business but does not exceed 30% ...	10%
On that part of the profit which exceeds 30% per annum of the capital employed in the business but does not exceed 40% ...	15%

On that part of the profit which exceeds 40% ... 20%

VII

The objections to any form of royalty which operates as a charge upon costs are well known. It is said that they operate to discourage the opening of marginal mines, that they lead to the by-passing of marginal ores in existing mines which once passed can never be recovered, that they tend to be relatively penal on high cost disadvantageous mines and relatively generous to low cost well-endowed ones. Thus, it is claimed, they increase the financial riskiness of opening new mining ventures and may bring forward the date when older ones have to be closed down. Similarly, if we assume that royalties need to be uniform for any given mineral, the owner of the mineral rights in a number of different properties (be he government or private person) is likely to face the following dilemma :- if the royalty is set low enough to make the most marginal mines profitable, the better endowed mines will be presented with the prospect of larger-than-necessary profits, but if the royalty is set high enough to reduce to normal the return on the richest mines, the more marginal deposits will be rendered unprofitable. One way out of this dilemma is to abandon the idea that royalty rates should be uniform for all mines of a particular mineral within a country. But although this is entirely logical in economic terms, there are other reasons of a political and administrative nature why governments when they own the mineral rights are very reluctant to take this course. Another way out is to relate the royalty rate to some measure of profitability - and we have seen instances in Ghana and Uganda and elsewhere of how this may be done. A third possibility is to abandon the idea of a royalty as a charge upon production (or perhaps simply reduce it to a minimal) and to take the rest of the payment for the ores in another form. This course has been becoming increasingly common.

One such form, which we shall examine next, comprises an exceptional (or additional) tax upon mining company profits. It does not much matter whether this is called a 'profit tax' (as in Botswana - though here it is allowable as an expense against income tax), or a Mining Tax (as in several Canadian provinces), or a Mineral Tax (as in Zambia); it is the principle and the mode of operation that are important.

In Botswana, De Beers Botswana Mining Company (Proprietary) Ltd., by the terms of their special agreements of 1970 and

1972 - pay a royalty of 5 per cent onthe gross proceeds of sales of diamonds, a profit tax of 10 per cent of the annual profits calculated as for Income Tax assessment, and company taxation at the normal rate, with the royalty and profits tax being allowable expenses. (As part of the same set of arrangements, the Government is also allocated 15 per cent of all equity issued by the Company from time to time, free of consideration.)

Also in Botswana, the agreements relating to the "Shashe Project" for the opening up of Selebi-Pikwe copper-nickel deposits establish a different form of regime. The royalty is set at $7\frac{1}{2}$ per cent of net income (with a minimum annual royalty payable in advance of Rand 750,000). The tax that the company, Bamangwato Concessions Ltd. (BCL), pays on its profits from mining operations is set at a basic rate of 40 per cent rising by 1 per cent for every 1 per cent by which the operating profit margin exceeds 48.5 per cent to a maximum tax rate of 65 per cent. For the purpose of this provision 'operating profit margin' means 'the result obtained by subtracting the production cost from sales revenue and expressing the difference as a percentage of sales revenue'. The royalties paid by BCL to Government are treated as a production cost. Again the Botswana Government is allocated 15 per cent of the equity.

The new Zambian legislation, while embodying much the same idea as is evident in the Shashe Agreements, approaches the matter in a different way. Under the new system, the major imposts on mining operations are based entirely on profits. Royalties and the export tax have been abolished. There are now two elements in the system:-

(a) Mineral Tax, and
(b) Income Tax.

The rate of tax on the assessable income of companies is currently set at 45 per cent. But it is the mineral tax which represents a mode of 'paying for the right to work the ores'. Mineral tax is chargeable on the assessable income as defined in the Income Tax Act at the following rates:-

Copper	.....	51%
Lead and Zinc	.....	20%
Amethyst and Beryl	.....	15%
Gold, Bismuth, Selinium, Cobalt, Silver, Cadmium	.....	10%

The Income Tax Act makes provision for mineral tax to be deducted as an allowance in ascertaining the gains or profits of a business for the purpose of the income tax. The effect of this provision when taken together with the Mineral Tax Act is to produce a combined rate of payment for the copper mining companies on their profits of 73.05 per cent.

Since the Zambian Government has already bought and paid for 51 per cent of the shares in the two main copper companies, the current situation with regard to all pre-royalty and pre-tax profits from copper mining amounts approximately to this:-

(a) Government takes 51 per cent of all pre-tax profits in the form of a Minerals Tax, as a charge for allowing the copper companies to mine the ore;

(b) Government then takes 45 per cent of the profits after payment of Minerals Tax, as ordinary corporation tax on company profits;

(c) Government then receives, as 51 per cent majority shareholders of the mining enterprises, 51 per cent of the post-Mineral Tax and post-Income Tax profits.

(d) A further 20 per cent withholding tax may be payable on those dividends relating to the 49 per cent minority holding which are payable abroad.

Matching these additional or exceptionally high charges on the income tax of mining enterprises in certain countries, other instances may be cited where the effective income tax rate upon mining companies is lower than normal. One common way in which this has been brought about is by allowing mining companies a 'depletion allowance' which permits them to reduce what would otherwise be their assessable income for tax purposes by a prescribed proportion. Another method is simply to specify a lower than normal rate of company taxation for companies recognized as mining enterprises. A justification for this second course is normally a recognition that the mining enterprises affected are encountering exceptional difficulties or are having to work an orebody nearing exhaustion. An example of such a sub-normal tax may be found in Uganda where the tax for mining companies (at $22\frac{1}{2}$%) is only half the normal company tax rate (this is in recognition of the difficulties being encountered by the Kilembe mines). A variation may be seen in the Swaziland tax provisions where the rate applied to mining enterprises varies between 27 per cent and $37\frac{1}{2}$ per cent depending upon the size of profit compared to a normal tax rate of 33 1/3 per cent.

VIII

The following formulation may be taken as a guide. The mineral royalty

(i) is a payment to the owner of mineral rights for the right to extract and sell the ore.

(ii) is a charge upon production.

(iii) should be variable with the value of the ore being mined.

(iv) should be so designed that the increase in the value of the ore accrues mainly to its owners.[29]

The relationship between the value of the ore and its price is neither obvious nor simple. An example will illustrate this. Supposing the cost of working an orebody is taken to be $100, while gross revenue to be obtained by selling the metal mined is only $90. If we assume comparative costs and prices to remain unaltered for ever then that orebody would always be of no commercial value. Now assume that the price of metal increases by twenty per cent, so that the gross return becomes $108, the value of the orebody now becomes positive, and if we were looking for a net present value we would say it was the equivalent to an income stream of $8 a year - again assuming comparative costs and prices will not alter further. Now assume that the price of the metal increases by a further 20 per cent while costs remain constant so that the gross revenue becomes $129.60. The point deserving attention is that this 20 per cent increase in selling price results in an increase of profit from $8 to $29.60 - i.e. an increase in profitability (and most importantly of the potential value of the orebody) of 370 per cent. A royalty appropriately designed should relate the charge levied for working the deposit to variations in the profitability and value of the deposit. Of course to do this changes in working costs have to be taken into account as well and a theoretically correct solution is made more complicated by continuing inflation. In practice, of course, the best that can be attempted may be a royalty designed to approximate the theoretical ideal in its operation but at the same time to be administratively straight forward and reasonably simple to explain and justify.

If quasi-royalties are defined broadly as types of imposts having the same intended effect as royalties, and if royalties are defined prescriptively as we have suggested above, the variety of types of royalties and quasi-royalties becomes very extensive.

The following list is not exclusive in the sense that some of the types listed could be further subdivided according to their manner of calculation. Its interest derives from the fact that all (or nearly all) of the types of charges listed are in use somewhere in the Commonwealth.

Types of Royalties and Quasi-Royalties

(i) Fixed amount per ton
(ii) Fixed percentage of value
(iii) Variable amount per ton, with production
(iv) Variable percentage of sales, with production
(v) Variable amount per ton, with price
(vi) Variable percentage per ton, with price
(vii) Variable amount per ton, with total profit
(viii) Variable percentage per ton, with total profit
(ix) Variable percentage of profit, with total profit
(x) Variable amount per ton, with profitability
(xi) Variable percentage per ton, with profitability
(xii) Variable percentage of profit, with profitability
(xiii) Mineral Export Tax, fixed amount per ton
(xiv) Mineral Export Tax, fixed percentage of value
(xv) Mineral Export Tax, variable percentage of value
(xvi) Mining Company Profit tax, in lieu of royalty
(xvii) Mining Company Surtax, in lieu of royalty
(xviii) Cost and revenue sharing, without Equity Participation
(xix) Right to Participate in Equity, free or at discount
(xx) Production sharing (i.e. proportion free for disposal)
(xxi) Compulsory state purchase, for resale
(xxii) Posting of 'artificial' prices for tax purposes
(xxiii) Differential exchange rate imposition
(xxiv) 'Royalty auctions'
(xxv) Obligation on Producing Company to provide infra-structure.

IX

The third element we have tried to distinguish amongst the imposts by which Governments collect revenue from mining enterprises comprises what we have called 'regular taxation'. A whole series of well-recognized difficulties bedevil attempts to compare the impact of taxation upon mining enterprises in different countries. One such difficulty involves the known differences that exist between the rates that are set in the ordinances, and the actual amounts (or proportions of income) that will be payable after all allowances and off-sets are taken into account.[30]

For instance, differing initial capital allowances, depletion allowances, tax holiday periods, treatment of losses, dividend withholding taxes etc. profoundly alter the actual impact of company, corporation, income or profits taxes even where the actual rates set in the budgets appear identical. A second such difficulty stems from the fact that exactly similar foreign enterprises in the same country may be differently affected by the host country's tax regime depending upon whether or not they can offset such foreign-paid taxes against tax liabilities in their own home country.

For all these reasons, the table of comparative basic tax rates set out below has to be interpreted with great caution.

Depletion allowances, which have the effect of reducing the mining company's income upon which tax is assessed, have been the subject of controversy for a very long time. Conceptually they purport to represent a recognition that the resource which the company is mining at a particular mine is limited, and that when it is exhausted the investment at the mine will have next to no residual value. In this, so it is argued, investment in mining is different from investment in most other types of productive activity. Therefore an allowance, analogous to the depreciation which is allowed against plant and equipment, should be established to reflect the gradual depletion of the orebody, or, as some commentators have put it, to recognize the fact that part of the income stream from the mine constitutes consumption of capital.[31] From here, it is but a step to argue that a depletion allowance should be set off against company profits before arriving at company income for tax assessment, just as is done with depreciation allowances. But since it is so difficult to know or agree upon the capital value of an orebody, depletion allowances (unlike depreciation allowances) most commonly take the form of a straight percentage deduction on profits, before arriving at the income of the company to which tax will be applied.

TABLE THREE

COMPARATIVE BASIC TAX RATES

COUNTRY	Basic company rate of tax %	Deple-tion allow-ance	Range of Initial allowances %	Capital allowances %	Can allow-ances exceed 100% ?	Withholding Taxes on divi-dends %	inte-rest %	M.ment fees %	Tech. royalties %
Sierra Leone	45	No		g		45	45	-	-
Ghana	55	No	10 - 20 f	5[c] 15min.[d]		55	55	-	55
Nigeria	40/45 [a]	No	Nil - 20	5[c] 10 12½[d] 12½[e]		-	40[a]	40[a]	40[a]
Kenya	40 47½[h] 22½[i]	No	40	10	No	12½	12½	20	2
Uganda	45 22½[i] 51¾[h]	No	40	10	No	Nil	12½	20[g]	20
Tanzania	40 47½[h] 22½[i]	No	40	10	No	12	12	20	20
Zambia	45	No	10	2[m] - 30		20	20		
Botswana	30	No	Nil	1	No	15	15	-	-
Lesotho	37½	No	-	30	No	-	30	-	-
Swaziland	27 [i] [b] 33 1/3	No	Nil	k	No	15[j]	7½	-	-

TABLE THREE (Contd.)

	Export Tax	Tax Holiday	Other Taxes	Exchange Control restrictions
Sierra Leone		Discretionary	Surtax 15%, Diamond Industry Profits Tax 27½%, Iron ore concession tax 5%	-
Ghana	₵ 2.50 per fine troy oz. gold	Discretionary		Important
Nigeria				-
Kenya				-
Uganda				Important
Tanzania				Yes
Zambia				Important
Botswana			Mineral rights tax 10% of value of mineral rights[n]	-
Lesotho	15% diamonds			-
Swaziland			Mineral rights tax R10 per each hectare, R50 after 5 years. Capital gains tax 37½%	-

TABLE THREE

NOTES

a. 40% is the rate of tax on the first £N 5,000, 45% is the rate on total profits in excess of £ N 5,000.

b. On taxable income exceeding 20,000 Rand the rate is 37½%.

c. qualifying building expenditure.

d. qualifying mining expenditure.

e. qualifying plant expenditure.

f. An investment allowance is also granted: 5% of the expenditure incurred on any industrial plant or machinery.

g. There is an annual allowance on "qualifying mining expenditure", which is calculated as the greater of either 1/20th or the basis period year's output divided by the basis year's output and future potential output.

h. non-resident company permanently established.

i. income derived from mining.

j. for companies carrying on business in Botswana, Lesotho, Swaziland or the Republic of South Africa the rate of tax is 12½%.

k. The annual allowance shall be the equivalent of such annual annuity payment as would aggregate over 30 years (or the expected life of the mine, whichever is the less) at 3% compound interest to the sum of unredeemed capital expenditure.

l. Residual capital expenditure including capital expenditure incurred during tax year, divided by expected life of the mine or thirty (whichever is less).

m. capital expenditure incurred by "new mines" is allowed in full in the year incurred.

n. or if higher, a rate of Rand 40 for every square kilometre of land or part thereof over which mineral rights are held.

Let us consider some of the issues arising from these points. To begin with, it is by no means clear that a mining enterprise is as different from a manufacturing enterprise as the argument would have us believe. Manufacturing enterprises are liable to go out of business if they do not modernise or diversify their product; and changing conditions may well induce them to change their location. The expenditure that has to be put into research, market survey, product re-design and the purchase of patents may be regarded as similar to the outlays that a mining company has to make on prospecting and exploration, or on the purchase of other mineral rights, if it intends to stay in business. The fact of the matter is that, while mines may become worked out just as factories may have to close down, mining companies do not necessarily have such a finite life. On the contrary, the trend is for a larger and larger proportion of the world's mining to be done by major multi-national groups whose life expectancy is not dependent on the reserves of one particular deposit.

Where the mining company does not own the orebody, but works a mining lease, the questions arise 'In what sense is it the capital of the company that is being depleted and paid out as income?' and 'If anybody is entitled to a depletion allowance to offset against his income, should it not be the owner of the mineral rights?'

Mineral royalties are nearly always allowable as a cost to the mining company before arriving at profit for income tax purposes.[32] The written down value of plant and equipment which has to be scrapped, or the shortfall below such value realized in a final sale of property where a mine has to be closed down is similarly allowable as a cost against income. And these allowances - one a revenue allowance and the other a capital allowance - take care of two aspects of a mine's exhaustible nature. There remains, however, the expenditure on exploration, prospecting, and on proving the deposits, the expenditure on the purchase of leases or rights to mine; and the preliminary expenditure undergone in establishing the mine. In a situation where the life of a mine is recognized as being limited, it is reasonable to allow these types of capital expenditure to be written-off against income over the life of the mine so that the owners of the mining enterprise may receive the equivalent of their original capital contributed back untaxed, while the income earned by that investment and any capital gain realized upon it are taxed in the normal way and at the normal rates.

But what of the owner of the mineral rights when the owner is not the government? What view should the tax authorities take of his receipts from royalties? A number of interpretations, depending upon how the rights were established, used and disposed of would appear to be equally admissible. Where the owner is himself the prospector (or prospecting company) which has discovered and pegged the claim, it would be reasonable to regard the royalties as earned income and his expenses in prospecting, pegging etc. as allowable expenses - either in the form of a loss brought forward, or to be set-off against income in the current year if the prospector was in the business of discovering and pegging claims. In neither case would a depletion allowance be appropriate.

Suppose, however, that the discoverer of the mineral deposit was to sell his established ownership of the mineral rights, rather than holding it and enjoying the royalties therefrom. In such a case, the tax authorities could appropriately look upon the receipts from the sale as income if the prospector was deemed to be in the business of discovering, establishing and selling mineral rights; but as a capital gain if the seller could persuade the authorities that dealing in such rights was not his normal business[33] - though in such a case the authorities might well be inclined to examine more stringently any claims for off-setting expenses. Parallel considerations regarding the treatment for tax purposes of the receipts from a sale of mineral rights would apply, had the rights in question been acquired through purchase rather than through discovery and pegging.

Let us next consider the situation where mineral rights have been acquired privately by purchase (or by inheritance), and when they are held by the owner who receives royalties from them. This would appear to be the sole circumstance in which a depletion allowance in recognition of the diminishing nature of the asset should conceptually be recognized.[34] The simplest way to compute this allowance would be to allow an annual deduction equivalent to the original cost of the rights divided by the anticipated life of the mine. (There are many examples of the practical procedure for doing this, most of them by way of a three-yearly revision). In times of general inflation, a factor to take account of this could be fed in. To those who would argue that the purchase price might grossly understate the actual value of the deposit, the answer should be made : 'Quite so; but if the original purchase price undervalued the orebody and the owner claims that depletion allowance is too small on this account, then it must also be acknowledged that the owner should become liable for capital gains tax on the increased value of his asset'. The extent to which the owner would then gain from an upward revaluation of his asset for calculating the depletion allowance would become a direct function of the difference between the tax rates applicable to company (or personal) income and those applicable to capital gains.

But conceptually and in terms of equity, it should be repeated that only the private owner of mineral rights receiving income from mineral royalties has a legitimate claim to a depletion allowance, and then only if he has acquired those rights in the ways specified.

Other proponents of the depletion allowance take a different approach. They cite the risks attached to mining enterprises, especially in the early stages, and the large outlays that have to be made upon exploration and prospecting, much of which is certain to be abortive, as reasons why income from mining should be effectively taxed, through the depletion allowance, at lower rates than income from other types of endeavour.

It may well be that the factors cited do have the effect of raising the minimum expected rate of return required before finance can be raised or committed for a mining venture above the average minimum expected rates required for investment in other sectors. But this does not, in itself, indicate any misallocation of investment funds; nor does it constitute, in itself, any reason why a government (particularly the government of an exporting country)[35] should take special steps to lower the tax rate upon mineral as opposed to other enterprises.

Moreover, even if it is decided that special encouragement should be given to the mining sector because of the desire to open up new mines, the percentage depletion allowance is both a crude and an expensive tool for government to use: crude, because it does not differentiate between projects which require special encouragement and those that do not; expensive, because, once established, it will extend over the whole life of the mine, and not merely assist in the early years when measures to allow for a reasonably early return on investment may indeed be sensible.

For the reasons cited we must conclude that the depletion allowance and, more particularly, the percentage depletion allowance - where it exists - is more the result of historical circumstances or of the successful political pressure of the miners' lobby than the product of rational fiscal logic. It is not therefore surprising that depletion allowances are generally going out of favour,[36] or, where allowed, that they generally have to be earned, as under the new Canadian legislation.

X

There are also variations in the way in which a government may charge for the right to mine its ores by taking a participation in the equity of the mining company. One such way, which has been adopted in Botswana, is for the government to be issued with a certain percentage of all equity stock free of any charge to itself. The second way, which was exemplified in the 1967 Bougainville Agreement, is for the Government to have the right to subscribe to a portion of the original share issue at the initial nominal value of the shares. A third way, which is exemplified in the 1971 agreement between the Government of Lesotho and the Maluti Diamond Corporation, is for the company to be offered an option to subscribe to a proportion of the equity capital at the original nominal value of the shares, with this option not having to be exercised until a full prospecting programme has been completed by the company. A fourth way, of which the operations of the Government of Ghana in relation to that country's gold and diamond mines provide one of many examples, involves enunciating a policy that a certain proportion of the equity of all major mining companies should be owned by the government and then 'inviting' the companies concerned to enter negotiations with a view to giving effect to this policy.

It may be assumed that each of these tactics has the effect of providing the government with a share of the equity (and therefore profits) of the mining enterprise at a lower price than it would have had to pay had such a share been acquired by purchases of stock in the market. The extent to which shares are acquired in these circumstances at below market price will always be a matter of dispute and judgment. It may sometimes be a matter of controversy too whether a share in such profits represents an appropriate element in a fair charge for extracting the country's mineral resources, or whether it should be construed as an example of a government taking 'unfair' advantage of a 'captive' foreign investment. Similarly there are likely to be some observers who regard some of the tactics employed in obtaining equity in this way as involving a breach of agreements and a manifestation of the unrealiability of developing countries' governments, while others will construe such methods as being an appropriate, legitimate and inevitable part of the strategy by which developing countries procure a larger price for the depletion of their natural resources and, in doing so, correct inappropriate arrangements which might have been agreed to or which may have been imposed upon them in the past.

XI

A mining company contemplating a major investment is likely to be most influenced in its decision by whether the expected rate of return on the investment is likely to exceed a certain required minimum rate. That is not to say that many other factors will not also have considerable weight - amongst such factors will be maintenance of market shares, importance of acquiring sources of supply for downstream processing, availability of surplus funds for re-investment, possibility of fitting in with complementary activities, desirability of achieving a geographical spread in investments, an assessment of the commercial and political risks in the particular country, the ambitions and drive of management, the pure size of the investment involved, and the possible alternative uses of the available funds.[37] Other factors could be mentioned, but it is convenient to regard them all as influencing either the required rate of return on the investment, or the expected rate of return; and further to assume that only if the expected rate of return exceeds the required rate, after tax, will the investment go ahead. This analysis can be assumed to remain true, with appropriate adjustments, where expected rates of return are arrived at by discounted cash flow analysis (DCF), and where separate calculations are performed (i) for rate of return on all funds invested, and (ii) for rate of return on participant's equity capital only.

This model of decision-making would make it appear that, being mainly concerned with the net after tax flow of distributable funds emanating from its investment, the investing company is indifferent as to the manner in which the various imposts, charges and deductions are taken by the host government. This is far from being the case, and to that extent the model is misleading. Let us consider four obvious examples. First example: if a major part of the Government's share is taken in the form of 'free' equity, this will dilute the return and may possibly make more difficult the raising of the remaining equity. It may also lead to demands for substantial government representation on the board which the company may fear will lead to interference in management decisions. On the other hand, a small (say 15 per cent) participation by Government in the equity is usually regarded as giving added security to the investment. Second example: a royalty formula which operates as a fixed charge upon costs may have a particularly serious effect upon profits when prices are low. The investing company might well prefer a flexible charge related to profits even if this resulted in a higher expected overall royalty payment. Third example: some forms of charges (i.e. company profits tax and income tax) in the host country may be usable by the company as a credit against tax liability in other countries while other forms of imposts (royalties, export taxes etc.) are not. Fourth example: income from management fees, production patents, sales commissions for the investing company may be looked upon as a more secure source of income than income from profits, and for that reason may be more highly valued than the same sum in the shape of an expected dividend.

XII

It would be extremely convenient if there were a uniform way to compare the proportions of gross sales value, and of pre-royalty and pre-tax company profits taken by governments through the various imposts that they use. But no such comparison is possible. The ways of exacting these imposts is by no means uniform, nor is there any reason why they should be. And all who try to analyse such matters will know that it is difficult enough to ascertain what proportion of profits the mining industry in a given country has paid out in royalties and taxes, let alone conduct a cross-country analysis of the effects of different assumptions about prices and working costs in a whole series of countries.

What is possible, or what at least may be attempted, is the formulation of a series of hypotheses (or generalisations) suggested by the evidence under review.

With those reservations, the following apparent generalisations can be put forward:-

(1) There is an extraordinarily wide range between the smallest and the largest government shares of the

revenues from mineral production, measured as a percentage of pre-royalty and pre-tax profits. The effective range is from little more than two per cent to over seventy per cent.

(2) No single explanation accounts for this wide variation, but a number of factors of undoubted significance can be cited.

(3) The maximum potential government take tends to vary with the mineral being mined - being highest for diamonds, gold and copper.....and lowest for minerals like iron ore, bauxite and manganese.

(4) The circumstances noted in (3) above appear to be partly a function of the value-to-weight ratio of the mineral, partly a question of whether the price of the particular mineral is in some sense abnormally high, and perhaps most importantly a function of the obtainability of alternative supplies of the particular mineral outside the country/continent being examined.[38]

(5) The comparative richness or poverty of a particular deposit is also of importance in determining the maximum potential government take. As the Ricardian theory of rent would lead us to expect, the maximum potential share (and also the appropriate share in countries where governments own the mineral rights) is highest where the deposits being mined are richest in ore and/or cheapest to work.

(6) It is usually - but not always - easier to 'up' the share of the government's take by changing the royalty, quasi-royalty and fiscal provisions relating to existing and well-established mines than by introducing such provisions before an industry mining the particular mineral has become established.

(7) Despite (6), it is clear that the average government's take both from established mining industries in African Commonwealth countries, and from the terms upon which new mining ventures are established is tending to increase.

(8) This increase is being brought above in variety of ways. Company tax rates tend to go up, albeit slowly, with development. Withholding taxes not only upon dividend and interest payments, but also upon management fees

and licensing fees, are being more widely introduced. Rents and other comparable fees are being raised.

(9) Royalties have not been subject to much variation - less indeed in Commonwealth Africa than elsewhere in the world. But wider use is being made of what we have broadly called 'quasi-royalty' arrangements - such as equity participation upon privileged terms, pre-emption of output, and production sharing.

(10) A rapidly changing concept of the appropriate role of the mining sector in developing African countries and of the appropriate financial relationships between government and major mining enterprises has not been matched by an equally rapid replacement of the main mining, minerals or associated fiscal legislation. What has been occurring instead has been the negotiation of a series of special agreements whenever major mining enterprises have had to be undertaken.

(11) Such mineral concession agreements are tending to become, paradoxically, both successful and unenduring. Successful in the sense that they succeed in establishing a basis upon which the particular mine can be financed and can start operations; unenduring in the sense that the financial terms of such agreements are very frequently either re-negotiated or over-ridden within a comparatively short time of the mine being opened.[39]

(12) The tendency for the level of imposts to rise over time, and the certainty that agreements that turn out to be too 'unbalanced' in their effects will be renegotiated are becoming more widely recognized by transational corporations and the international financial community.

(13) The desire of developing country governments for greater participation in the enterprises which mine their mineral resources and for greater control of their operations is also becoming more widely recognized - and recognized as legitimate as well. This desire is being matched by an increasing willingness by transnational mining groups to offer a substantial equity participation to host governments, and to subject a wider range of activities to host government guidance or control.[40]

(14) It is noticeable that mining companies - especially transnational companies operating in the countries under review - prefer high tax rates,or excess profits taxes or

supplementary mining taxes, or equity participation to devices such as increased royalties or export taxes that might, conceptually, be a more appropriate way for charging for the resource being extracted and exported.

(15) It would be interesting to determine whether the relative importance of the mining sector in any economy displayed a positive or negative correlation with share of the Government's take . But no such simple relationship can be confirmed.

FOOTNOTES

1. The Company has the right to choose at the commencement of production an applicable interest rate of 20 per cent or a rate which for each year will be 10 per cent above the U.S. prime domestic borrowing rate.

2. In the annual report issued by the Department of Mines and also in the Quarterly Review of South African Gold Mining Shares published by the Mining Journal in London.

3. Certain other gold mines are not included in the list either because they have accumulated losses which reduce lease and tax liability to zero, or because they had not at that stage completed a financial year.

4. Quotations from De Beers Consolidated Mines Limited, Annual Report, 1974, p.6.

5. The countries whose mining regimes are specifically under review are Sierra Leone, Ghana, Nigeria, Uganda, Kenya, Tanzania, Zambia, Botswana, Lesotho and Swaziland; but reference may also be made to the arrangements in other Commonwealth or former Commonwealth countries, such as Canada, Australia, New Zealand, the Republic of South Africa, Jamaica, Guyana and Papua New Guinea.

6. The legitimacy of separating out surface rents from mineral royalties - regarded as a form of sub-surface rent - has itself been disputed, the argument being that a full rent should conceptually incorporate the charge for using the surface and subsurface together in their most profitable possible joint uses. Whatever the theoretical merit of this approach, it remains true that most of the legislative regimes under discussion do distinguish imposts of type (A) from those of type (B).

7. As in the Republic of South Africa where base metal leases used to take the form of a fixed 10 per cent of profits, while precious metal mines paid a lease consideration on a sliding scale formula depending upon the ratio of profits to revenue.

8. As in Canada, see Digest of Mineral Laws of Canada, by E.C. Hodgson, published by the Mineral Resources Division of the Department of Energy, Mines and Resources.

9. As in Ghana, and in Zambia prior to 1970. See "A Future for Zambia's Copper Industry?" in "Towards Economic Independence", by M.L.O. Faber and J.G. Potter. (C.U.P.)

10. As in Botswana.

11. As in Papua New Guinea.

12. The Minerals Rights Tax introduced in Botswana in 1972 is a connoisseur's example of a tax introduced not to raise revenue but to achieve a social purpose - in this case to induce the residual owners of mineral rights to make them over to the state. The social purpose was completely achieved by 1974; while the actual revenue raised by the tax was nil.

13. Taxes that might accurately be described as severance taxes on minerals are of course much more common in the United States of America. See "State Taxation of Metallic Deposits" by W.A. Roberts, Harvard University Press 1944.

14. For instance the Minerals Regulations of Nigeria provide for the reduction, remittance or waiver of the rents and fees payable under the Regulations as follows:

"The rents set out in the Second Schedule shall be so paid but the (Governor-General) may, whenever he may think fit, reduce or remit either temporarily or for the remainder of the term the amount of any rents payable under this regulation.

The fees set out in the Third Schedule shall be so paid except that the (Governor-General) may, whenever he may think fit, reduce, waive or refund in whole or in part any fee payable under this regulation: Provided that the Chief Inspector may, upon good cause shown, reduce, waive or refund in whole or in part the fee payable on the withdrawal of any application."

15. "The unusual capacity of the mining industry to create wealth for an economy, to literally turn what was once rock or dirt into a valuable metal.....needs to be more fully understood ...." Chairman Henry S.Wingate's message to shareholders of the International Nickel Company of Canada, Feb.18, 1971, quoted in Eric Kierans "Report on Natural Resources Policy in Manitoba",1973.

16. The parallel is of course with Ricardo's theory of rent, and John Stuart Mill's prescription for its taxation.

17. Examples of precisely these attitudes are to be found in the unamended minerals legislation of virtually all the countries under review.

18. Amongst important mining agreements of this type in the countries under review are :

Sierra Leone

(i) The Bauxite Mineral Prospecting and Mining Agreement 1961 (ratified by Act No.35 of 1962).

(ii) The Diminco Agreement 1970 (ratified by Act No.22 of 1970).

(iii) The Sierra Leone Rutile Agreement 1972 (ratified by Act No.1 of 1972).

(iv) The Tonkolili and Marampa Agreements 1937, 1944, 1947, 1956, 1967 and 1973.

Zambia

(i) The Heads of Agreement between the Republic of Zambia and the Industrial Development Corporation of Zambia Limited and Bancroft Mines Limited and Nchanga Consolidated Copper Mines Limited and Rhokana Corporation Limited and Rhokana Copper Refineries Limited and Zambian Anglo American Limited dated 24/12/69.

(ii) The Agreement between the Republic of Zambia and the Industrial Development Corporation of Zambia Limited and Roan Selection Trust Limited dated 24/12/69.

Botswana

(i) Agreements between the Government of the Republic of Botswana and De Beers Botswana Mining Company (Proprietary) Limited dated 2/3/70 and 10/8/72.

(ii) Master Agreement between the Republic of Botswana and Bamangwato Concessions Limited and Botswana

R.S.T. Limited and BCL (Sales) Limited dated 7/3/72.

Kenya

(i) The Agreement between the Industrial and Commercial Development Corporation and Continental Ore Corporation and Bamburi Portland Cement Company Limited dated 8/3/71.

(ii) The Agreement between the Industrial and Commercial Development Corporation and Geomin (a body corporate established in Romania) providing for the development of certain deposits of ores of various metals including lead, zinc and silver.

It will be appreciated that a number of these agreements do not relate to new mining ventures but to terms and conditions of government participation in existing mining operations.

19. One could, for instance, take as a starting point the Sierra Leone Bauxite Agreement of 1961, progress through the Bougainville Agreement of 1967 concluded by the Papua New Guinea Administration, and arrive at the De Beers Botswana Agreement of 1970.... noting the progressive tendency for the terms to be enjoyed by the governments owning the mineral rights to improve. This is certainly a valid and significant trend. However, too much cannot be inferred from the contents of any one agreement. The minerals and the potential profitability of the deposits differ. The strength of the bargaining position, and the knowledge and skill of those conducting negotiations vary. And, as Louis Wells has pointed out, there tends to be a geographical similarity as well as a temporal similarity to the terms negotiated in major mining agreements because companies adjust their demands and expectations to the terms of the concessions that other governments <u>in the region</u> have granted.

20. Viz. Michael Manley, in his statement to the Jamaican Parliament...."We do not accept the idea of bauxite being exploited for foreign companies in whose ownership we do not participate and over whose operations we have no influence or control."

21. One must avoid being too facile about this. Nonetheless, both Chilean and Tanzanian nationalisation arrangements

affected the 51 per cent nationalisation proposals in Zambia. There was inter-influence, both on the Government and on the companies' side, between the measures negotiated in Zambia and Zaire. The Zambian example had an influence on measures which Ghana introduced to effect a 55 per cent government holding in the main gold and diamond mines. And the Ghanaian actions influenced the declared policy of the Government of Sierra Leone. The two Botswana agreements are perhaps more precedent-making than precedent-following. The Jamaican Government's 1974 action in raising taxes on bauxite production, although clearly influenced by the success of OPEC producers in raising the effective export price of oil, is also likely to create a precedent as statements by the Governments of Guyana and the Dominican Republic have already indicated.

22. Two quotations from Alcan's significantly low key reaction to the Jamaican impositions are illustrative :

"The unilateral manner in which the taxes have been imposed in contravention of understandings and contracts with the Government causes us serious concern. Actions taken in this manner inevitably undermine the confidence with which future investments can be undertaken," and "Bauxite is a plentiful ore and there are vast deposits of alternative materials that become economic if the prices go too high." Statements by J.H. Hale, executive vice-president, finance, of Alcan Aluminium Ltd.

23. See the EEC Secretariat's document on Europe's prospects of procuring future raw material needs.

24. The insistence of the Western Australia government that major infrastructural developments should be constructed as part of the price for being allowed to work major mineral deposits; and the 1974 action of the Queensland government in raising its mineral royalties.

25. viz. the actions of the governments of British Columbia, Alberta, Manitoba, Saskatchewan and Newfoundland.

26. viz. the British Government's changed attitude to North Sea Oil profits and the renegotiations insisted upon by the Norwegian Government.

27. "Mining Royalties and Rents in the British Empire" published by the Mineral Resources Department of the

Imperial Institute in 1936; and "Royalties on Minerals in Certain Commonwealth Countries (including Dependent Territories)" compiled by the Mining Law Section of the Mineral Resources Division of the Overseas Geological Surveys in December 1961 contain comprehensive information on royalties as they existed at the time of their publication. But no later compendium of comparable coverage has been prepared.

28. "Mining Legislation in British Commonwealth Countries where Minerals are vested in the Crown" by F.R.H. Green, published in 1964 by the Institution of Mining and Metallurgy describes the "three main royalty systems in use" as being

"(a) a profits tax or levy based on the "profitability" of the mine;

(b) a percentage or sliding scale based on the value of the production or sales from the mine; and

(c) a fixed sum per ton or other unit for each mineral or metal raised or sold."

and asserts that each is suitable under different circumstances.

29. Compare F.R.H. Green's assertion :

"A mineral royalty is a compensation to the owner for the exhaustion of an asset and ideally, therefore, should be fixed at a figure bearing some relation to the value of the mineral as it lies in the ground, i.e. the sale of the mineral recovered less a reasonable charge for extraction, treatment and transport to the point of sale, sufficient to cover all costs and overheads including a reasonable return on the capital expenditure, together with the provision for the amortization of that capital."

30. See in particular the Report of the Public Accounts Committee of the House of Commons on North Sea Oil.

31. See for instance "Some Notes on Mine Taxation" by H.W. Faulkner in Transactions of the Institution of Mining and Metallurgy, volume XLIX, 1939-40, where he argues "that profits from mining must be considered partly as interest on the capital invested and partly as a return of capital, since in calculating the operating profit no deduction

is made for the raw material - the ore in the mine - that has been used up in the process. The part of the profits representing the return of capital, corresponding to the disappearance of the raw material, should be free of tax. In other words a deduction for this depletion of the ore reserves should be allowed in arriving at the taxable profits. It appears to be the general opinion that, when the average of successful and unsuccessful mining enterprises is considered, a deduction of 50 per cent would be a reasonable allowance."

32. But this is not the case with regard to the mining of bauxite in Sierra Leone. See "An Act to Ratify and confirm an Agreement for the Prospecting and Mining of Deposits of Aluminium Ores in certain Areas in Sierra Leone" 1961.

33. The tax authorities in New Zealand are prepared to regard mineral prospecting as a hobby for many people - and one to be encouraged at that. Nor is there a capital gains tax operating in New Zealand at present.

34. However in exactly parallel circumstances, when a householder holds a limited lease but lets the house in question, no allowance is allowed by the British tax authorities to compensate for the diminishing period or value of that lease.

35. It would be more logical for the government of an importing country to do so if, by stimulating local production of an ore, it believed it could reduce the price that it would have to pay for its imports of the same ore.

36. "The most notorious of taxes affecting natural resources is of course the income tax with its special depletion allowances, including discovery value depletion, percentage depletion, and provision for the expensing of development outlays. That these provisions can hardly be defended on any principle of income definition that will stand scrutiny, or in terms of equity between individual tax payers, is fairly clear ....." from William Vickrey "Optimum Rates of Depletion" in M.Gaffney "Extractive Resources and Taxation"; Wisconsin, 1967.

37. It was recently argued by one company that the most important single consideration in its decision to go ahead with a mining project was its own estimated production costs

compared to those of other producers. So long as such production costs were significantly lower - so it was argued - the prospective mine would be likely to do better than average when mineral prices were high and would survive long enough to remain in production when prices were low.

38. The degree of vertical integration characterizing the companies extracting the particular mineral may also be influential.

39. Two partial explanations can be put forward to account for this paradox. First, the anticipated range of rates of return has to be much higher at the stage of exploration, proving the orebody, feasibility studies and project financing than it needs to be ex post facto to provide a sufficient cash flow to service loans and to pay dividends that will provide a good return on capital invested. Second, the high mineral prices of the past few years have provided most such projects returns towards the upper end of their "upside potential".

40. Transnationals have not been slow to discover that a system that grants 51 per cent ownership to the host government, but combines this with appropriate Articles of Association, management and sales contracts, financing agreements etc. can procure for them a higher rate of return on a lower capital sum risked, with greater security. Students of these matters will, by now, be able to draw up an "ideal-type" of contract that procures all these.