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Zambia's Mineral Fiscal Regime

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I. Introduction

My objective is to examine Zambia's fiscal regime for minerals. The discussion begins with a description of Zambia's fiscal regime in an international comparative context (Section II). Section III contains a framework to evaluate the country's minerals policy in the context of the broader fiscal regime. An evaluation of the regime and proposals for both short-term and longer-term reform are contained in Section IV. Emphasis is placed on developing a foundation upon which the policy and administrative apparatus can evolve through time. A brief summary (Section V) completes the analysis.

The new government appears to be commited to increasing government's return from mining via increased enforcement, review of existing contracts, and changes in the fiscal regime, such as the recent increase in royalty rates and restrictions on the use of hedging.[1] In general, there appears to be room for government to achieve this objective based on the discussion in this chapter. Increasing government's return is not costless, however, and it is important that government decision makers think systematically about how greater returns are achieved. My view is that an incremental approach where administrative enhancements are coupled with rationalization of the various revenue instruments is preferable to imposing additional charges without rationalization of existing instruments.

II. Comparative Mining Fiscal Regimes

A description of Zambia's fiscal regime is found in Table 1.[2] Tables 2, 3, and 4 contain comparative information about the current structure of royalties, profits taxes, and excess profits taxes (and other matters), respectively, in a sample of countries.[3]

Zambia's regime is a variant of a traditional royalty–tax regime in which the government charges a royalty and then imposes the generally applicable tax regime, with perhaps special provisions for mining.[4] There is a supplemental revenue charge (based on the ratio of taxable income to measured sales), as well as equity participation retained as part of the privatization process and held by ZCCM-IH. This system resulted, in part, from the privatization process and was modified significantly in 2008 and again in 2010. The royalty rate has been increased twice, first to 3% and then to

[1] The increase in the royalty rate and change in hedging were part of the 2012 budget. Statements by representatives of the new government about the desire to increase revenue from mining can be found in numerous press reports, including: Els (2011), Topf (2011), Mfula (2011), and Schneider (2011).
[2] No evolution of the fiscal regime is supplied. Excellent reviews are found in Adam (1995), Adam and Musonda (1999), Adam and Simpasa (2009), among other sources.
[3] The information supplied is only a summary. Detailed tables can be supplied by the author or can be found in Conrad (2010).
[4] Fiscal policies in mining might be classified into four groups: royalty–tax arrangements (such as Zambia), production sharing, service contracts, and direct state operations. These distinctions will not be pursued here given the use of royalty–tax arrangements for mining throughout the world. The latter three methods are more common in oil and gas, although there are exceptions (for example, Chile has a state enterprise for copper mining and Mongolia has proposed a service contract structure for mining).

6%, and the variable profits tax was introduced. A type of windfall profits tax was enacted in 2008 but was repealed in 2009.

a. Terminology

The vocabulary for particular mining charges, such as royalties and windfall charges, is not uniform so knowing the name (royalty for instance) does not necessarily explain how the charge is computed (the base). Thus, it is important to take account of these differences in the discussion that follows. For the purposes of this chapter, the following definitions will be used, in addition to the more commonly known concepts of income taxes, withholding taxes, and equity participation, among others:

Royalty: A payment to the owner of the reserves (usually some level of government)[5] that is the indicator the purchase price [or relative price] of ore at the time of extraction.

Excess or Windfall Charge: A charge in addition to (or perhaps as a substitute for) a royalty and all generally applicable taxes. Application of the charge will depend on some legislatively-defined trigger related to the specified base.

There are only three ways for the government to accrue revenue from any private sector entity, other than nationalization: confiscation, direct equity participation, or loans to the firm.[6] For my purposes, these three revenue-raising methods will be called "bases" and will be defined as:

Fixed Fee: A payment to the government independent of the level and timing of extraction. Examples include proceeds from bidding, signature bonus payments, and required annual fixed payments.

Production: A payment based on the level of extraction, intermediate production (concentrate), or final output (ingot), as defined in the law or contract. The total payment depends on the total measured flow of the base per unit of time. This charge may be computed in one of two ways:

Per Unit: Calculated as a specified price (measured in some currency) per unit of the base.

Ad Valorem: Calculated as a specified proportion of some measure of the base's value (again measured in some unit).

[5] The differentiation of payments into royalties and taxes will be explained below, in addition to how property rights allocation differs around the world.

[6] Random charges might also be applied but such charges are ignored for current purposes.

Costs are not considered in computing the base. The charge may be variable, with the variation being determined by specified triggers (base prices, production thresholds, etc.). Such variable charges are sometimes called "price participation" arrangements in private sector transactions. Examples of production charges in Zambia include the royalty and the now-repealed 2008 Excess Profits Tax.

Profits (Income): A charge based on some measure of net income. Net income can be measured in a variety of ways, including a cash flow basis, an accrual basis, a current basis, a cumulative (or Net Present Value) basis, or an average (rate of return) basis.[7]

Costs are considered in computing the base. The charge may be variable with the rate change triggered by particular levels of the base, such as total profits, rates of return, or net present value. Examples include standard income taxes, the Resource Rent Tax (RRT),[8] and various variable profits charges.

It is important to note that hybrids of these basic structures exist. For instance, the Zambian variable royalty is based on a trigger average profit per unit of sales (taxable income divided by total sales), above which a charge is applied to a measure of profit.

b. Royalties

Royalties are used in all surveyed countries and most are ad valorem (See Table 2). Australia (Northwest Territories) and Canada (both British Columbia and Saskatchewan) are exceptions and employ a type of ring-fenced[9] measure of net proceeds. Rates in these mining areas are higher as a result.[10] The variable rate per unit charge in China, which approximates an ad valorem rate, is also an exception.

Ad valorem royalty rates for copper vary, generally ranging between 0% and 8%. Zambia's 3% and new 6% rate falls between these extremes. The rates, however, may be misleading because the base to which the royalty rate is applied also varies across countries. The bases, even for ad valorem charges, are generally some measure of output value. Terms such as "net sales," "gross proceeds," and "gross value" may have similar or different meanings depending on actual practice. In particular, it is important

[7] Economic income (rent) is in general a different measure from a profits (or income) basis as applied. Economic income is the surplus in excess of all opportunity cost to a particular person. This concept will not be used in the current discussion.
[8] The Resource Rent Tax (RRT) was first proposed by Garnaut and Clunies-Ross (1983).
[9] Ring fencing is an accounting method in which the base is computed with respect to a particular property, regardless of the other economic interests of the operator.
[10] Mineral rights are vested in the Canadian provinces. I understand that mineral rights are somehow shared between the states and federal government in Australia.

to know at what point in the production process the charge is imposed (for example, at the mine mouth, at the smelter, concentrator, or border) and how values are computed (for example, final output prices, arm's-length contract prices, net smelter returns, or netback pricing). How the base is measured will determine the effective rate and the administrative aspects of application.[11]

Some countries, such as Peru and South Africa, use variable rate royalties and the use of a variable rate might be interpreted as a type of excess profits tax scheme or, alternatively, a type of price participation system common among private-sector participations (see discussion below).[12]

Special note should be made of recent proposed changes in Chile and Australia. Beginning in 2011, Chile has introduced a variable system on a voluntary basis for two years. The rates revert back to previous levels after the two-year period. The benefit for those choosing the higher rates will be that stabilization agreements will be extended for 10 years after the rates revert.[13] After a review of the entire tax system, Australian analysts proposed that the states repeal their ad valorem royalties and substitute a type of Resource Rent Tax (RRT) system for mining. An RRT system has been used for federal oil and gas leases for some years. The state royalties would be a credit against this charge, at least as originally proposed. The law enacted in November 2011 will impose a charge of 30% on returns (measured in terms of a mine's net present value) in excess of a long term bond rate plus 7%.

c. Income Taxes (Profits Taxes)

A profits tax is imposed in all countries and on most investments (see Table 3). Zambia and South Africa impose a variable profits tax on mining in addition to the standard income tax.

Profits tax rules are generally applied uniformly across industries, but there are industry-specific provisions for each sector, including mining.[14] Two aspects of mining

[11] For present purposes, the effective rate is defined as the ratio of the charge to the economic definition of the base. For instance, the effective rate for an ad valorem royalty will be: the amount paid per unit/economic value of unit used to compute the charge. The denominator's value may or may not be related to the value used in practice. The Zambian royalty is an example. The royalty is the LME price of copper multiplied by the metallic content of the commodity (ore, concentrate, ingot) at the point where the charge is imposed. By definition, the LME price will not be equal to the value of the quantitative measured employed unless by accident.

[12] It is common for transactions between both related and unrelated parties in metal mining to have price participation clauses as part of their contracts. For instance, the contract between a mine-concentrator and a smelter may contain provisions in which the smelter obtains a proportion of the excess above the base price. Such a provision, I understand, is part of the agreement between some companies and ZCCM (Zambia Consolidated Copper Mines), in addition to the standard equity participation.

[13] Part of the motivation for the rate change was to finance reconstruction in part resulting from the earthquake.

[14] A rate in excess of the standard corporate rate might be interpreted as a royalty scheme or a rent-skimming scheme, depending on the facts and circumstances.

are addressed specifically in most tax laws: exploration and development.[15] Zambia, consistent with cash flow accounting, provides for immediate expensing of both exploration and development. This is the method employed in a number of other countries (Australia and Canada), though some countries (Mongolia), employ capitalization and amortization. Differences, perhaps significant, in effective tax rates will result from this variation across countries because of the relative size of exploration and development expenditures to total measures of profitability both in total and at the margin.

Most countries employ some type of thin capitalization rule, generally based on some measure of debt and equity, as in Zambia.

d. State Participation

State participation varies from none (the United States, Canada, and Australia) to mixed in at least four other surveyed countries. Chile has one state-owned copper company that must compete against private sector companies. Three countries take a minority interest in private sector firms (Mongolia, Peru, and Zambia), but terms under which shares are obtained vary. Zambia appears to have retained an equity interest in mines that were privatized.[16] Peru's system appears to be uniformly applied while the state in Mongolia has the option to take up to a 34% equity interest (generally financed with a carried interest) on a mine-by-mine basis.

e. Excess Profits Taxes

Excess profits taxes have become more common in oil and gas (assuming that production sharing is a type of excess profits scheme). Such schemes are less common in mining. Kazakhstan and Mongolia are the only surveyed countries that use profits taxes on mining, at least in name (see Table 4). The excess profits tax used in Mongolia replaced the 68% presumed profits tax that was repealed in 2010. Rates vary based on the type of output (ore, concentrate, refined product) and price and are not directly related to profits (and thus are a type of variable royalty according to definition). The South African variable rate system (which is the model for the Zambian variable rate system) is based on a measure of one type of average margin.

[15] Reclamation may also be addressed in the income tax laws.

[16] The state company Zambia Consolidated Copper Mines – Investment Holdings (ZCCM-IH) is the successor to the former operating company (ZCCM) and operates as a holding company for the State's equity interest in the private enterprises. Equity participation varies by mine (see Adam 2010), and there appears to be a form of price participation. ZCCM-IH is charged with using the returns, if any, to first discharge prior obligations such as debt service and accumulated pension liabilities.

f. Other Taxes and Terms

i. Stabilization

Countries vary with respect to stabilization provisions. Canada, the United States, and Australia do not use stabilization in their mining regimes. Mongolia employs stabilization by contract. Some mineral operations benefit from stabilization, but others do not. Chile has used stabilization to apply uniform regulations to the industry for a fixed term. That is, stabilization for all operations ends at the same date regardless of when the operation began.

ii. Value Added Taxes (VAT)

The VAT is considered to be a destination-basis consumption tax and thus, in principle, the charge should be imposed in mining. Given the large import content of mining operations and the fact that much, if not all, production is exported, special arrangements are sometimes used. These special arrangements are deemed necessary because mining companies would be in a perpetual excess credit position, which means that refunds would have to be paid to the investors on a monthly basis. Sometimes governments resort to ad hoc methods (such as exempting production or exempting imports) in an effort to reduce or to eliminate the need for the investors to pay VAT on inputs and collect refunds for exports.

iii. Withholding Taxes

Withholding taxes are generally imposed on payments to nonresidents who are sourced in the country imposing the tax. These charges are "in-lieu of" the domestic income tax and are based on gross income, as opposed to net income, because the taxpayer, the recipient of the payment, is not a registered taxpayer in the source country. Withholding taxes displayed in Table 4 reflect statutory rates that might be modified by treaty on a country-by-country basis. Note that Zambia specifically exempts dividends from withholding tax despite the generally applicable 15% rate.

iv. Tariffs and Export Duties

Tariffs can be used for revenue (such as the uniform tariff in Chile), for protection (on finished goods in particular), or both. Rates in Table 4 vary by country, which reflects protection motives at least in part. Given the export nature and lack of domestic input supply, mining investors may enjoy reduced rates or exemptions (Mexico). Russia is the only major mineral-producing country that imposes export charges; those charges are generally limited to oil and gas.[17]

[17] The Russian export tax in its current form was imposed after the financial crisis in 2008 to sop-up gains to domestic producers from the significant devaluation of the Ruble.

g. Summary

Countries vary with respect to their fiscal regimes and these differences in function may reflect social choices, such as mineral ownership patterns, policy choices, and administrative constraints. For instance, the United States federal government does not impose royalties except when minerals are held by the state.[18] Given these differences, one might conclude, as I have, that there is no international "best practice" for treatment across the range of potential instruments used by governments. Governments appear to choose to undertake different functions which lead to differences in both the type of instrument employed and the risk borne by the state.

III. Fiscal Analysis Framework

A government of a country endowed with mineral assets might perform five different economic functions, four of which have direct financial consequences:

- Manage the resource on behalf of the population;
- Impose and administer the general tax regime;
- Take equity positions in some, or all, mining operations;
- Use state enterprises as operating companies; and
- Regulate the mining industry (health and safety, environmental, and other regulatory functions).

Payment stream elements, the total cash flow to government, and the risks borne by the economy will be affected by how many functions are undertaken and the choice of instruments. The payment streams are only a partial measure of the gross benefit to government, however. That is, total gross economic benefits to the country could be greater than the financial gain to the government because the financial gain to the government is a measure only of the distributional benefit. For instance, a government might forego tax revenue in order to require a mining company to purchase inputs from domestic sources.[19] Such a requirement might benefit domestic suppliers, on a net basis, if the value of supplying the goods and services is greater than their opportunity costs. Economic costs are imposed as well and thus it is essential that the gross benefit be balanced against the real costs in order to ensure positive economic returns, including the growth of the economy.

[18] The standard example is off-shore petroleum. The US federal government imposes a royalty equal to 16 2/3% of the measured price as compensation for extracting the reserves.

[19] In addition, fiscal revenue losses might be direct or indirect. A direct revenue loss would result if a government explicitly reduced a payment in return for domestic sourcing. The loss might be indirect if the government simply required domestic sourcing; since costs to the firm are higher than without the rule, profits taxes paid by the mine would be reduced by more than the increase in taxes paid by the supplier.

Some benefits and costs of each of the four revenue-generating functions are summarized in Table 5 and a description is provided below.

a. Manage the Resource on Behalf of the Population: Returns to Ownership

A country must determine how mineral ownership rights are allocated. State ownership of subsurface rights is common in most countries. Ownership may be at the national level (Zambia) or at the sub-national level (Canada). Mineral ownership means that a government's assets (or balance sheet) will include the value of the subsurface rights in addition to other assets, such as assets of state enterprises, government buildings, and the power to tax (an intangible asset). If a deposit is developed, then the government may receive financial flows from a variety of sources, including but not limited to:[20]

i. Land rents;
ii. Bonus payments;
iii. Auction values;
iv. Royalties; and
v. Resource rent charges (often called resource rent taxes).

The type of payment, the timing, and the amounts will depend on a country's legal framework, how extraction rights are awarded, the quantity and quality of the deposit, and other factors. It is important to note that the government is responsible for the speed with which resources are exhausted and thus can use these instruments, along with production quotas to the extent quotas are not redundant, to influence how much operators develop and determine extraction within and between time periods.

Resource extraction is not costless to any economy. At a basic level, the wealth of the economy is reduced with cumulative extraction. In addition, the government closes off options for different contractual forms or methods for awarding contracts to different investors by determining a particular contract form and choosing a particular operator (either public or private sector entity). The government, and society more generally, foregoes the use of surface rights and other rights resulting from the need for such assets in the production of subsurface minerals. Finally, the government must administer the fiscal regime as well as monitor, and hopefully actively husband, the resource base.

At a more aggregate level, extraction may change the diversification of the economy's asset base. A resource discovery increases the variety of assets in the economy, which is reversed as the reserves are depleted. Significant resource

[20] The value of the reserve base might change even if the deposit is not developed. For instance, governments should expect a competitive return from holding reserves because, at a minimum, reserves are assets from an economic perspective. Thus, a government holding assets in the ground is foregoing selling those assets, or converting them into cash or other tangible (intangible) assets that accrue cash income. Thus, a government needs to be aware of this opportunity cost of developing deposits and should hold reserves as long as the returns are at least as great as those foregone costs.

discoveries can affect domestic relative prices, which can have adverse impacts on non-resource sectors. For instance, the price of nontradables may rise because, at least in the short run, the stock of nontradable assets may have to be reallocated between preexisting economic activities and new mining activities resulting from an appreciation of the real exchange rate. Sector-specific losses may result, in traditional export sectors in particular, and such costs are part of the real cost of resource development (and to the extent they occur, should be part of any mineral evaluation).

b. Impose and Administer the General Tax Regime: Return for Rights to Taxation

The right to tax is vested in the state. This asset enables governments to accrue economic resources from the private sector without directly supplying goods and services in exchange. That is, unlike the private sector, the government does not have to sell a good or service to generate revenue. Most governments choose alternative means to collect tax revenues, including:

i. Direct taxes, such as profits and personal income taxes;[21]
ii. Indirect taxes, such as VAT, excises, and tariffs; and
iii. Property taxes.

With the exception of certain discriminatory taxes such as excises (fuel, tobacco products, and alcoholic beverages) and selective tariffs, taxes (direct taxes and VAT in particular) are generally applicable. That is, tax policy is (and should be) designed to accommodate economy-wide effects. Thus, mining should be treated like any other sector with respect to overall tax policy, particularly with respect to the use of direct taxes and VAT.

Three elements of the income tax are particular to mining: the treatment of expenses for exploration, development, and reclamation. All three elements, however, have similar counterparts in non-mining industries: exploration is effectively searching and is similar to research and development; development is a type of self-constructed asset; and reclamation is similar to expenses related to plant closure (disposal of hazardous waste, restoration, and other issues). A significant issue in the VAT treatment of mining is related to the export nature of production and the use of imported inputs, particularly during the initial investment stage. VAT refunds would be significant if standard VAT treatment is afforded to the mineral sector. These problems, however, are similar to any new investment where imported inputs are required and the output is designed for export. In emerging economies, this is the case with manufacturing in general.

The costs of developing a generally applicable tax system include administration and compliance costs. Such costs are complicated by the asymmetric nature of the information structure. Taxpayers have access to information about revenues and costs

[21] Capital gains taxes are really income taxes and are defined as such for current purposes. The treatment of capital gains, particularly for trade in mining licenses, is becoming an important issue.

while tax administrations may have little or no means to independently verify that information. In addition, incentive compatibility is absent in a tax system because there is not a direct transfer of goods or services in exchange for tax payments. An additional cost of a generally applicable tax system is the adverse economic incentives created by lack of direct exchange. Incentives are created to change investment and labor supply decisions, which may reduce real net national income.

c. Take Equity Positions in Some, or All, Mining Operations

Some countries, including Zambia, have chosen to take equity positions in particular mining enterprises. Potential financial gains include dividends from shares and capital gains.

Such gains are not costless, even if shares are so-called free equity. The government as a minority shareholder may be adversely affected by decisions made by those with majority positions, particularly in countries where transparent corporate governance is lacking and shareholder protection is weak. The government and economy more generally may bear two additional costs. First, the government now owns rights to physical capital and intangible assets held by the mining company in addition to holding the reserves. Thus, the government is taking a longer position in mining and there will be a higher correlation between overall government revenues and mineral prices (or returns to mining more generally) unless the government pursues an active risk diversification strategy. Second, the economy will be less diversified, all else equal. Funds used to invest in mining enterprises could have been used to invest in other domestic and international assets (with perhaps higher marginal returns) in addition to reducing the society's exposure to mineral price risk.

Finally, there is an additional cost that is common to both passive and active equity positions. The government may be placing itself in a direct conflict of interest. Taxes reduce profits and environmental standards may reduce profits. Thus, the government must actively trade off implementing effective tax and regulatory policies with reduced financial gains from asset ownership.[22]

d. Use State Enterprises as Operating Companies

State enterprises may take a majority interest in mining enterprises and may themselves become operating companies. Potential dividends and capital gains increase with larger equity interests and the government can directly affect the operating decision of the enterprise, which in turn may affect both the level of financial benefits and their distribution.

[22] It is sometimes claimed that the ability to influence corporate decisions via board membership afforded by share ownership is a benefit for government. Influence is limited, however, when the government is a minority shareholder. It should also be noted that the government is a sovereign state and has the power to regulate and influence corporate decisions directly by government action. This power, if properly and appropriately applied, may be more important relative to the benefits of holding minority positions.

The costs of using state enterprises as operating companies include greater financial costs (relative to passive equity ownership), making the economy even more dependent on mineral production for government revenues. That is, this strategy increases risk bearing in minerals, unless mitigated by other means, and decreases the diversification of the economy. Potential conflicts of interest are greater relative to passive equity participation. In addition, there is the risk that state-operated companies will be less efficient relative to private sector counterparts unless those enterprises are placed in competitive situations in both the output and input markets.

e. Summary

In summary, governments may accrue financial benefits from mining in different ways. If form follows function, then the structure and levels of the financial flows will depend on the different types of functions undertaken by the government. This implies that concentrating on the "total take" may be inappropriate because the economic objective is to maximize the net social benefit from mining (or any other activity) and the "total take" is a measure of the gross financial benefit without regard for the structure of the costs required to accrue various components of the gross benefits.

In addition, cross-country comparisons of total take may be misleading unless adjustments are made for the number and structure of functions undertaken by the government. For instance, mineral rights on private lands are not held by the government in the United States. The US federal government does not collect mineral factor payments in this case. In addition, there are no state-owned mining enterprises in the United States. Chile, on the other hand, has both a state mining enterprise and state ownership of reserves. Thus, comparing the gross benefits (or total take) between the United States and Chile would be misleading absent adjustments for the payment streams which flow to private parties in the US (royalties and returns to ownership of mineral enterprises) but to the state in Chile. That is, the total take to the economy could be the same in the US as it is in Chile, but the distribution of that revenue is different, resulting in a different measure of government revenues.

IV. Evaluation and Analysis

Zambia's mineral fiscal regime contains four elements:

i. A royalty;
ii. The generally applicable corporate tax (including some withholding taxes on remittances to nonresidents);
iii. A variable profits tax; and
iv. Equity participation.

This structure is reasonable given the history of the sector's development and the current situation. Policy makers and the general public should consider improving each element so that the system as a whole can function in a more coordinated fashion. Consistent with this objective and with the framework developed in the last section,

policy makers might consider elements contain in checklist found in Table 10. This section contains an evaluation of the current regime, followed by a discussion of the themes that might serve as guidance for refining and implementing a reform.

a. Problems with the Current System

i. Inadequate Revenue

General and mining-specific revenue statistics are found in Tables 6 – 9. It is clear that the revenues were not significant in the post-privatization period and have improved since the changes in 2007 and 2008.[23] The revenue increase after 2005 may reflect the amortization of loss carryforwards resulting from the reorganization of the mineral sector (corporate taxes began to increase), the use of deemed prices for the royalty and for the income tax for some producers, better mineral prices, and improved monitoring. The royalty, once modified, seems to be the most stable revenue source, with the profits tax taking a larger proportion of total revenues during periods of relatively high prices (Table 6). The shares of mineral revenue to total tax revenue (including royalty) have also been increasing recently and exceed minerals' share in GDP (Tables 7-9).[24] Mineral revenues should be a greater share of total revenue relative to sector value added because the government is collecting royalties on a factor of production; a phenomenon unique to the mining industry.

On balance, it appears that the revenue situation is improving, but this does not imply that revenues are either adequate or reasonable. The number of mines actually paying is known to be relatively few. Perhaps more mines will begin to pay a reasonable amount once stabilization agreements expire and monitoring is improved. Expensing provisions may hamper revenue collection, even with improved enforcement, because mines appear to be making incremental investments often. Thus, given the current regime, the government might expect only marginally higher revenue, except for the royalty, which may imply that the revenue system is neither adequate in a dynamic system nor stable over the longer term.

ii. Structural Issues

The basic structure of the royalty – tax regime, as modified and adjusted since 2008, is reasonable in my view while the variable rate profits tax is a concern for methodological reasons described below. What is not reasonable is the regulatory and

[23] Revenue figures are on a receipts basis and thus represent neither charges actually payable nor the correct timing of accruals. For instance, payments in 2008 might represent charges (including interest and penalties) arising from any prior year. Thus, it is not possible to discuss the impact of particular policy changes given these differences. In addition, the collections are 2001 represented occurred arrears with a settlement negotiated in 2011.

[24] GDP estimates depend significantly on how mineral values are determined. It may be the case that GDP is underestimated given the reliance on transfer-priced exports in GDP estimates. It might be beneficial for those computing GDP to investigate alternative methods of measuring minerals' contribution to GDP.

administrative framework in which these charges and the tax system more generally must operate. There are two general problems:

- The system is plagued with incentives both for mining and across sectors. These individual deals are tantamount to an individualized tax system, which makes administration impossible, particularly when tax administrators may not have access to specific provisions of the individualized development agreements or other contractual provisions.[25]

- Definitions and rules are not clear, there appears to be significant discretion about how tax provisions are applied, and public information about how the rules should be applied is scarce. This situation raises the potential for honest taxpayers to exploit the legal ambiguity for their benefit, for dishonest taxpayers to evade taxation, for corruption within the tax administration, and for inevitable, but what might otherwise be unnecessary, disputes. For example, the quantities used as a basis for the royalty vary by producer. Some pay royalty on extraction, others on concentrate, and still others on production of smelter output. This means that effective rates are not uniform and that adverse incentives such as a marginal incentive for inefficient downstream processing may exist.

b. Corrective Actions

Recommended policy changes are noted in the third column of Table 10. Some in-depth analysis will be needed to implement the policy changes.[26] Emphasis here, however, will be placed on the policy themes necessary for successful reform.

i. Correctly Measure Price (P) and Quantity (Q) for Royalty Purposes

Determining the output price (P) and quantity (Q) are the most important variables in any mining fiscal regime. Under current law, the government should accrue more than $0.46 from a one-dollar increase in total revenue (either by an increase in the price holding quantity fixed, or an increase in quantity holding the price fixed), holding all else constant. That is, a one-dollar increase in revenue should increase the royalty by $0.03 (.03*$1) (now .06), the profits tax by $0.29 (.3*$0.97), and the dividends to ZCCM-IH by $0.14 (.2*(1-.3)*$0.97), assuming that ZCCM-IH holds a 20% equity interest. The value of $0.46 is a lower bound for a profitable firm because the variable profit charge may increase government revenue by a greater amount. Price and

[25] The government claims the negotiated agreements of November 2010 would be uniformly applied, but it is not possible to evaluate this claim unless documents are made public and administrative procedures are made uniform.

[26] Memoranda by the author supplied to the Government of Zambia via the International Growth Center contain some initial technical analysis.

quantity (particularly quality-adjusted quantity) are only estimates in the mining industry in the best possible situations and so the government has every reason to seek improvements in the measures of both price and quantity.

In addition to potentially increasing government revenue, improving the measurement of price and quantity has several benefits. First, audits could be more accurate because auditors would be able to measure input/output ratios and other audit indicators. Second, companies could increase efficiency by identifying excessive production losses at each step in the chain of domestic value added. Third, determining export values and GDP would be easier and more accurate.[27] Finally, revenue forecasting and receipts estimation can be improved, in addition to providing better information for overall macroeconomic management.

It appears that Zambia is not capturing these benefits because of the ambiguity in the definitions used to measure P and Q. The use of deemed prices such as the LME price is reasonable for the computation of the royalty and, perhaps, as a base price of the income tax for related parties. This value should be quality adjusted, however. Through time, the use of deemed prices for related parties and the valuation of output for independent transactions might be refined. The LME price is generally publicly known and can be independently monitored. Thus, given available data on arm's length prices, or their derivations, estimating an arm's length price may be costly to administer and be no more accurate relative to a reasonable posted pricing system.

Given such complications, Zambia should continue using the LME price as the measure of value for royalty purposes for the foreseeable future. That price is known, cannot be manipulated by any party, and is publicly available at little cost. The price should be computed by the government and supplied to both the producers and the general public so that everyone has knowledge of the price to be employed for the prior month.

ii. Correctly Measure Quantity (Q) for Royalty Purposes

Currently, the royalty in Zambia may be applied to concentrate, either at the time of export or sale to domestic smelters, smelter output (cathodes), or production depending on the firm. This means that the effective royalty rate, and, perhaps, the income tax rate, may vary across firms. To illustrate, assume that the LME price is based on 100% pure copper (for simplification purposes) and that the LME price is $8,000 per ton. A royalty of 3% imposed on the transfer in London would accrue $240 to the government. Pure copper is not exported from Zambia, however, and even if pure copper were exported, the true economic border price would be less than $8,000 because of transportation costs.[28] For instance, if concentrate in Zambia were 50%

[27] Government officials might consult Canadian officials, among others, who have addressed the issue of how to adjust export values and GDP statistics for transfer prices between related parties.

[28] A person wishing to purchase copper cathodes would have to pay the LME price plus transport from London to Zambia for copper cathodes from non-Zambian sources. Domestic sellers of copper cathodes would receive only the LME price less transport on exports, leaving the transport cost differential to be

copper, then simply using the LME price would imply that the deemed value of copper concentrate would be $4,000 per ton of concentrate when the LME price is $8,000. Of course, this value is too high relative to any true economic value. Smelting, storage, transportation, insurance, and waiting are all costly activities. Thus, the effective royalty rate will be higher than 3% when the LME price is used as the benchmark price and no other adjustments are made. Suppose that smelting and transport costs are $5,750 per unit of concentrate and that two tons of concentrate are required to produce one ton of copper cathode. The value per ton of copper concentrate would be $2,250 in this case. The value of $2,250 may correspond to a deemed net smelter return[29] for concentrate for our purposes and thus the effective royalty will be 5.33%.[30]

Two points can be derived from this discussion. First, international comparisons of royalties are of little or no value without knowing the base to which the rates are applied. For instance, a royalty of 5% is imposed on the net smelter return in Mongolia. Whether the 6% royalty in Zambia is lower or higher relative to the Mongolian royalty depends on whether the net smelter returns in Mongolia are lower or higher (in an economic sense) relative to the effective base in Zambia, all else equal. For instance, the royalty might be applied to ore and not concentrate. Second, there may be variation in effective rates across mines in Zambia depending on the stage at which the royalty is imposed. To the extent possible, such incentives should not be present because inefficient domestic processing may result.

Given the factors described above and other administrative difficulties, such as the potential to impose a royalty of imported ore processed on a tolling basis, the Zambian Government should impose the royalty as far upstream as possible and use the LME price (however defined) as the measure of value. The charge should be imposed on "production" and not "sales" for royalty purposes. At a minimum, the government should attempt to impose the royalty on concentrate. This recommendation has a number of advantages:

- The combination of an exogenous price for the royalty (the LME price) and the quantity recommendation means that administration for the royalty becomes similar to administration for the excise tax. That is, a mine (and/or concentrator) effectively becomes a bonded warehouse (like a cigarette warehouse) where the most important administrative consideration is control of quantity.

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arbitraged between buyers and sellers. Competition among suppliers, to the extent that competition exists, would result in a domestic price (measured in foreign currency) equal to the LME price less transport. This basic dynamic will be used to determine the efficient price for current purposes.

[29] Again, a competitive measure of the net smelter return will not, in general, be equal to the arm's-length price for two unrelated parties unless certain assumptions are made; assumptions that are not applicable in practice.

[30] Two factors may be responsible for any difference in the competitive price of smelter output relative to concentrate. First, competitive processing costs are strictly positive. Second, production losses occur. That is, more than two tons of 50% concentrate are required to produce one ton of copper in smelter output because recovery is less than 100%.

- The government collects a royalty regardless of production losses at the concentrator or smelter. Effectively, the time of sale is the time resource extraction. That is the time the royalty is imposed will be the first "measurable" point, not the first "marketable" point. The government is selling a scarce resource and thus should not be penalized by (or benefit from) inefficient (or particularly efficient) processing. In effect, 100% of the copper is used to produce smelter output even though less than 100% of the copper is sold to another party in the form of smelter output.

- Netback computations, while they may be necessary for profits tax purposes, are not required for royalty purposes.[31]

- There is no need to measure own concentrate for smelters that are part of integrated operations.

- There is no need to be concerned with related party transactions outside Zambia in cases where concentrate is exported.

- Variations in effective rates will be less variable if the measure of output is more uniform across producers.

  There are some costs, however.

- Some concentrate transfers are made on an arm's length basis and those firms operating at arm's length will pay a higher effective rate relative to the computation based on the LME deemed pricing system. That is, the effective rate will be greater than 6%. This point, however, is a policy issue about the appropriate level of the effective rate. As long as variation in effective rates across producers is reduced, then the government can periodically review whether the effective rates are too high or too low.

- Producers may be concerned about the arbitrary nature of using the LME price for a commodity whose value is highly, but not perfectly, correlated with the LME price. In effect, using the LME price, all else equal, shifts more of the risk for changes in downstream production and distribution costs from the government to the producer (than when the net smelter return or a net back method is used).

- It is imperative that the government obtain (and audit) production measures. I understand that production statistics are supplied to the Central Bank, the Ministry of Mines, and the tax authorities, among other agencies. I also understand that the measures reported to each agency might differ and thus there is a need either for reconciliation or a unification of definitions.

[31] The netback for profits tax purposes may be different from the netback for royalty purposes. For instance, a netback to concentrate would be required if the royalty is imposed on concentrate, but a netback would be required only to the border for profits tax purposes when smelter output is produced domestically.

There is some particular merit to the first two concerns. The issue, however, is not with respect to the measure of value, but to the effective rate. If Zambia is competitive in its pricing at 6% of the LME price, then the gains from simplification and transparency outweigh these costs. It is important that Zambian authorities increase their efforts to maintain comparative information on prices, transport costs, processing costs and other international statistics so that Zambian experts can review Zambia's competitive position. The risk issue is not significant in my view. The government is now directly sharing in the price risk (by taking a proportion of the LME price) and the companies can mitigate the variation in input costs to a certain extent by entering into formal contracts with suppliers and other means. In addition, it might be the case that mineral producers have a lower cost of bearing such risks relative to the people of Zambia.

The measurement issue is the most important concern, but diligent monitoring of production should be part of the basic regime regardless of how royalties are computed. As noted, the government owns the reserves and is selling those reserves to a producer. Thus, the government (and the population generally) has the right and the need to know, as well as the responsibility to measure and monitor the quantities transferred to the producers. This responsibility includes reasonable access to data and the right to take samples. If government agencies do not have the equipment or expertise to perform their own testing, then the government should contract with independent agencies until such time as the infrastructure necessary to supply independent valuations exists.[32]

iii. Clarify Definitions in the Profits Tax

Definitions and operational valuation rules affect the profits tax as well as the dividends and other payments to minority shareholders. Clarification of the tax rules and regulations should be improved and it might be possible to make such changes without amending the statute.[33] Some specific issues and recommendations are discussed below.[34]

1. Gross Income

Gross income is generally defined as total receipts of the taxpayer, but there are two issues of practical importance for mining in Zambia. First, ring fencing is applied in

[32] At a minimum, there needs to be better coordination between the Central Bank, tax departments, Ministry of Finance, and Ministry of Mines on obtaining samples and reconciling differences in measurement.

[33] A legal opinion will be necessary to determine how proposed modifications to instructions and regulations might be implemented.

[34] Technical language is not supplied in this document. Examples of sources where technical language can be found include The Basic World Tax Code, the various publications of the OECD Committee on Fiscal Affairs, British and US tax law (given the common law heritage Zambia shares with the UK and US), and in unpublished documents I have drafted for tax reform efforts in other countries.

Zambia for profits tax purposes.[35] This means that transfer pricing becomes a domestic issue depending on the degree of vertical integration and whether one taxpayer operates more than one domestic mine. Some mines export concentrates, others sell concentrate to domestic smelters on an arm's-length basis, and others sell smelter output. In addition, some vertically-integrated operations process concentrate on a tolling basis, at least with respect to concentrate imported from the Democratic Republic of the Congo (DRC).[36] The industry structure indicates that transfer prices on domestic transactions for ring-fenced activities will have to be monitored as well as transfer pricing for international transactions.

2. Other Income Tax Issues

Most areas of the income tax on mining should be reviewed and policy makers should become more aware of options. Particularly important issues include:

a. Definition of related party for tax purposes,
b. Definitions for the thin capitalization rule,
c. Policies and methods used to monitor input costs,
d. Hedging expenses and the need to reduce the potential for abuse, and
e. Ring fencing.

3. Variable Profit Scheme

This charge appears to be based on the South African variable royalty (see Table 1). Under this scheme, the ratio of taxable profit in Zambia to sales (however defined) is computed. If this ratio is greater than some value (.08), then an additional charge is applied to some measure of profits.

This charge makes little economic sense even in a pure form and is only marginally related to standard notions of excess profit (positive NPV, a threshold rate of return), except, perhaps, as some adjusted measure of the return to invested capital net of tax depreciation.[37] To understand the concern, note that the ratio can be expressed as unity less the ratio of average cost (AC) to price (P) for any given level of production and sales (Q), or:

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[35] Gross income for tax purposes will include interest income, income from services, and other types of income when ring fencing is absent. This discussion will be limited to valuing mineral output, however defined, and some services.

[36] Hedging is common for large, integrated mining companies. Valuation issues are raised because of the vertical integration present in some firms, the fact that consolidated reporting for corporate profits tax purposes is not allowed in Zambia, and the presence of related party transactions.

[37] This ratio is used in corporate finance as an indicator of annual margins. As noted in the text, this value is an average and is not an indicator of profit levels (the true measure of profitability on a flow basis), the return on assets, or the opportunity cost of capital for the firm.

$$\frac{P*Q - AC*Q}{P*Q} > .08$$

$$or \qquad 1 - \frac{AC}{P} > .08$$

This ratio is an average of profit to sales. It is an indicator generally used in finance as a crude measure of some average margin. It is neither an indicator of profitability nor of comparative profitability across firms. Accordingly, it should be not be used as an investment criteria. As a practical matter, the trigger value of .08 (or any value) is some measure of the normalized profit margin (normalized using the price). That is, the variable profit charge will become effective if:

$$.92P - AC > 0$$

Another way to say this is the trigger value will be equal to .08 if price is equal to 1.087 of the average cost. One might infer that the value of .08 is some proxy for presumed real (net of inflation) return to capital, but this is not the case because it is easy to show that if the necessary return to capital were included, then .08 would be equal to the ratio of the total return to capital divided by sales, or:

$$.08 = \frac{P*Q - AC*Q}{P*Q} = \frac{r*K}{P*Q}$$

where: r is defined as return to capital (after depreciation); and
K is the value of the capital stock.

That is, the trigger rate of .08 is equal to the required return on capital, r, times the ratio of the value of the capital stock to sales. The latter ratio is unknown and is certainly not constant across investments, particularly on a measured annual basis. Thus, without knowing the value of the capital stock, any inference about the trigger value being some required return on an accrual basis is questionable at best.

The basic problem with the methodology is that it is an average but excess profits, if they are to be defined at all, are total values, not averages.[38] Thus, it is possible for one mine to have a large net present value, a large capital cost, and a large margin on some measure of profits to sales while another mine has a high ratio (greater than .08 in this case) with negative returns to true equity (or may even be technically bankrupt).[39]

[38] Another average, the internal rate of return, is sometimes used to measure excess profits. Again, however, there is no necessary relationship between internal rates of return and profitability levels, either on a flow basis or on a net present value basis. That is, a mine with an internal rate of return of 20% could have a lower net present value than a mine with an internal rate of return of 10% when both cash flows are discounted at 15%.

[39] It would be more transparent to state that the trigger value is simply an operating margin above .087.

These issues can be illustrated via a numerical example. Suppose Firm A has a ratio of taxable profit to sales of .1 while Firm B's ratio is .06. Firm A will pay the variable charge while Firm B will be exempt. Firm B's profits, however, could be 1000 while Firm A's profits could be 100; hardly an indicator that Firm A should be paying additional charges relative to Firm B.[40]

A simpler way to achieve a proxy for the level of incremental profits is to make the additional charge a function of the price.[41] For instance, a variable royalty would have a similar result if the trigger price were equal to 1.087 of some publicly-available price. That is, if the LME price were less than 1.087 of a base price, then the variable charge would not be active. In effect, the presumed margin over average cost would be the same as the system described in the last section. I do not advocate using a .087 margin, but suggest that the trigger be computed annually and that it might be based on one standard deviation above the mean of the historical LME price adjusted for inflation. This means that the charge will become effective only about 16% of the time when prices are unusually high.

A variable rate royalty has been introduced in the Canadian province of Alberta (a two-part charge on oil) and recently in Chile (as a temporary measure), among other places. This charge has a number of advantages:

- The industry is familiar with the charge. Such charges are known as "price participation agreements" and are common in the industry. For instance, a smelter commonly receives a proportion of the price above some base price as part of contractual process regimes. ZCCM-IH has some price participation agreements with firms in which it holds equity. In effect, the variable charge is a type of risk-sharing system in which the beneficiary shares the upside gain, presumably in exchange for a lower base price. Given the common use of these agreements, industry representatives can hardly complain about a government selling reserves and receiving this type of compensation.

- The system is transparent and there will be few disputes.

- The system might approximate a flat-rate income tax. Conrad (2008) has shown that a variable royalty might be used to approximate a flat-rate income charge and provides some examples. Thus, a variable rate charge, if the rates are

[40] Note also that all of the valuation issues pertaining to the income tax carry over to this charge as well. I understand that the numerator is computed as profits after tax and interest deductions, which is different from the South African model in which the numerator is profit before taxes and interest.

[41] There is a serious question about whether any type of excess profits scheme is needed if the recommendations made in this chapter are enacted in addition to other reforms. The combined fiscal return to the government including increased profits from ZCCM-IH should increase significantly if the proposals are enacted. Risk sharing is significant given the structure of the profits tax and equity participation. Thus, Zambia's risk-adjusted return from owning reserves may be significant, at least in terms of a competitive return, and effective tax rates may be sufficient to reduce, or to eliminate, the need for any excess profits tax.

relatively reasonable, is not a "progressive charge" when measured relative to the appropriate base (economic income).[42]

There are costs, including the fact that the government needs to balance the benefits of a flat-rate royalty relative to those from a variable royalty. In particular, the base royalty rate might be set a bit lower if a variable component is added. For instance, the base rate might be 4% if there is no variable component; with a variable scheme, the base rate might be 3% if the price is less than some trigger price and 6% on the "increment" above the trigger price. Note the variable component is on the marginal increment and not on the entire value if the observed price is above the trigger. Thus, the government might have to trade off some increased variability in revenue for higher expected revenue if a variable royalty is considered.

iv. Modify Tax Stabilization Clauses[43]

Stabilization clauses are part of the existing mineral agreements in Zambia. It might be in Zambia's best interest to let the existing stabilization clauses expire or to modify stabilization regimes in the future, at least for new investments. Most companies have had at least ten years to recover their capital plus a reasonable rate of return from their investments. These privatized projects were inefficiently operated in the past but the mineralization was known, there was access to markets, and there were some assets.[44] Thus, risks were reasonable and ten years is an adequate time to capture a basic return on capital given these circumstances and relatively high mineral prices. Existing investors should accordingly be subject to any modifications to the current fiscal rule on existing and incremental investments or at a minimum benefit from more restrictive stabilization regimes.

Stabilization provisions for future investments may be another matter. Stabilization provisions have been used to protect mining investors from capture. That is, a mining company makes significant investments in exploration and development that ex post are not movable. Thus, a country might induce a company to invest with attractive terms, but then arbitrarily increase effective rates once the investment is made. The investor will not leave as long as short run variable costs are covered, but any competitive return on the entire investment may be lost. This concern is valid and some stabilization might be employed as long as Zambia is in a transition.

That said, stabilization should be neither one-sided nor unbounded. With regard to the former, any stabilization provision should provide stabilization for both parties.

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[42] That is, a variable royalty might approximate a flat-rate income tax. Progressivity should be defined with respect to economic profit on a flow basis (or net present value on a stock basis) and, if progressive, the average effective rate should increase with the measured base.

[43] I am assuming that some type of contractual relationship will be necessary for the foreseeable future. The long-term goal is to make mineral contracts, if they exist, pro forma in the sense that the relevant fiscal provisions will include only a statement that the investor will be subject to the country's generally applicable tax and mineral laws.

[44] In addition, it appears that the investors who participated in the privatization were not burdened with at least some of the liabilities, such as accrued pensions, from the predecessor ZCCM.

One-sided stabilization is a situation in which the investor is protected from tax increases, however defined, but may opt to switch regimes if taxes are lowered. Such a practice should be abandoned. That is, investors should not be allowed to take advantage of tax decreases, however defined, at their discretion.[45]

With respect to the latter issue, there may be at least three methods to limit stabilization.[46] First, the stabilization provision should be limited in time. The government might consider providing a stabilization period sufficient for the investor to reasonably expect to recover their capital investment plus some return before being exposed to unforeseen changes in the fiscal regime. Second, the government might provide stabilization from de facto discriminatory changes in the fiscal regime. Some claim that a stable fiscal regime is necessary in order to attract investment. The United States and most developed countries would not satisfy this criterion because, at least in the United States, significant changes in tax law are made during almost every legislative session.[47] What taxpayers need, and should expect to have, is to be treated in a non-discriminatory fashion. With regard to mining stabilization, stabilization might first be limited to the royalty and excess profits regime because these charges are not generally applicable. Stabilization of the overall profits tax, the VAT or other taxes such as excise taxes might be resisted, however, unless it can be demonstrated that the changes as applied are discriminatory. Finally, stabilization should not be free. Zambia might adopt the Chilean model and offer stabilization in exchange for higher rates (for instance, increased royalty rates).

v. Address Minority Ownership

Zambia Consolidated Copper Mines (ZCCM-IH) holds a minority interest in privatized mines, has taken an equity interest in other mines, and has price participation agreements with some corporations in which it has equity participation. Results reported from ZCCM-IH are less than what one might anticipate given the significant time lag since privatization, the periods of high copper prices, and efforts to rationalize the mining industry's operations. In particular, the government, as 87.5% owner of the holding company, has received few, if any, dividends from ZCCM-IH.

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[45] To the extent that one-sided stabilization is retained, the option should be irrevocable. A tax decrease is clear when rates fall holding the base constant, but what constitutes a tax decrease may not be clear in other situations. For instance, if the government changes the foreign exchange provisions, then whether a particular taxpayer will benefit with lower taxes depends on the facts and circumstances. Taxes could be lower in some years and higher in others. Taxpayers should not be allowed to switch from one regime to another. That is, if the taxpayer switches to the new regime, then that election should be irrevocable for the term of the stabilization agreement. See Daniel and Sunley (2010) for alternative methods to modify stabilization provisions.

[46] Stabilization should be limited to the fiscal regime to the extent applied. That is, the investor should be subject to current labor laws, environmental laws, and other statutes as modified. In addition, stabilization should be limited to parties to the agreement and should not be extended to service providers or to any related party.

[47] It may not be variability of the tax system that is important but the environment in which changes take place. Taxpayers may adapt to frequent tax changes if the process is transparent, participatory, and non-discriminatory.

There are a number of reasons why this might have occurred. First, ZCCM-IH has been obligated to assume significant debts from the predecessor national company. These debts include accrued pension benefits and other severance costs for employees laid off as a result of the privatization. There also appears to be outstanding lawsuits against the predecessor company that have not been resolved and a significant environmental legacy project. It is important to know the current balance sheet values of these items, but the most recent public information about the composition of assets and liabilities is not generally available.[48]

There might be other reasons for the weak financial performance, including the nature of the contractual relationships between the holding company and the majority investors. None of these contractual relationships are generally available.

The Government of Zambia holds 87.5% of ZCCM-IH and should rapidly renew the process of holding the company accountable for its significant investments. In effect, expenditures by ZCCM-IH are a type of off-budget financing that would benefit from full disclosure and public discussion. In addition, ZCCM-IH is a state enterprise with the immediate implication that it is accountable not to the government but to the people of Zambia who should have information sufficient to make informed decisions about the company's performance. Thus, the government should:

1. Require ZCCM-IH to publish all contracts and agreements between ZCCM-IH and the companies in which it holds equity, including the exact nature of any price participation agreements, any carried interests, and other relevant information about the nature of the relationships. The government and the public more generally have a responsibility and the right to monitor how their assets are being used. In addition, there is little foundation for confidentiality of financial agreements between ZCCM-IH and the companies in which it invests because of the public nature of the ownership.

2. Require ZCCM-IH to publish cash flows and income on at least a quarterly basis by type of inflow (dividends, price participation, and other general category) and expenses. The statements should be on both a cash and an accrual basis. Inflows (or gross revenues) should be by type and payer. That is, if dividends are paid, then the amount, payer, and date of posting should be reported.

3. Provide a public report of the status of legacy expenses, the rules under which they are being amortized, and any underlying liability to the Government of Zambia more generally.

4. Require a public accounting of the ownership of the remaining shares (the State holds 87.5% of ZCCM-IH), complete with names, addresses, and

[48] The company's website contains a statement that audited financial results for 2007 – 2009 are in preparation. The financial results are simply summaries and there is no detail about the composition of assets and liabilities. The unaudited results for 2009 indicate a loss.

proportional ownership of any person who owns directly or indirectly more than 1% of the remaining shares.

5. Require publication of any transactions between ZCCM-IH and any of its shareholders, including the government. This should include the nature of the contractual commitments, the amounts and specific terms of items such as shareholder loans, service agreements, and other forms of compensation.

6. Begin to actively monitor ZCCM-IH, including the flows between the government and ZCCM-IH, as part of the normal budget process and report the net position of the company as part of the budgetary accounts. The flows to and from ZCCM-IH can then be evaluated within the overall budget guidelines established by budgetary legislation.

The government through ZCCM-IH and ZCCM-IH itself may need to act to protect its interest against the majority shareholders. The majority shareholders may exert significant influence over the financial practices of the operating company but management of the operating companies should seek to maximize shareholder value regardless of who owns the shares. Such an objective may be jeopardized when there is a majority shareholder who seeks to maximize their own returns and who can influence the operating and financial decisions of the operating company. Some of these decisions may adversely affect the returns to minority shareholders. The problem is similar in substance to manipulation of prices to reduce profits tax and similar rules should be applied in the financial accounts to protect the minority shareholder. For instance, the majority shareholder may influence the transfer price for copper between the operating company and a related company. A low price might effectively transfer profits at the expense of the minority shareholder. A second example is a situation in which the majority shareholder makes loans to the operating company, and then the operating company uses the interest on the loans to reduce its profits and dividends. In effect, the majority shareholder can transfer profits to itself at the expense of the minority shareholders by accruing 100% of the interest expense while reducing what would otherwise be dividends to the minority shareholder.

Given the numerous transactions between the majority shareholder and the operating company, it is important for ZCCM-IH and the Government of Zambia more generally to exercise due diligence with respect to all major transactions between the related parties. Thus, the government should use the protections provided by corporate law to minority shareholders, both locally and internationally, to ensure that the majority shareholder's return is proportional to its true equity interest. This due diligence can be achieved only by requiring the operating company to report all, or at least all significant, transactions between the majority shareholder and the operating company, complete

with a description of the basis for the transactions, the methodologies employed, and the financial values involved. The list of transactions includes, but is not limited to:

- Management agreements,
- Service fees (provided by the majority shareholder for supplying particular services),
- Sales agreements (and values of transactions), and
- Credit agreements.

Accounting for these transactions should be based on applicable accounting standards and these standards may vary with the Zambian tax rules. Options are available for transactions under most applicable accounting standards and it is important for ZCCM-IH and the government more generally to investigate whether available options could be employed that might otherwise increase the operating companies' results and thus ZCCM-IH's dividend. For instance, transfer prices for output may not be based on values that would maximize the value of the operating company but rather maximize the value of the returns to the majority shareholder.

In summary, it is important for ZCCM-IH and the government to ensure that their financial interests are protected by publishing information and acting in a consciously self-interested professional manner to monitor the transactions between the related parties.

V. Summary

Zambia's fiscal regime for mining has begun to improve and it is important to increase the momentum for reform. I believe the recommendations presented here are consistent with the new government's commitment to transparency and increased revenue yield. Such reforms should provide: (1) a stable policy environment that allows the country to capture a competitive return for its natural assets, and (2) a more neutral fiscal regime that is both transparent and consistent with sound economic principles.

Table 1
Zambia's Minerals Regime

1. I. Profits Tax

Item	Treatment
Tax Rate	General rate 35%. LUSE listed companies – 33%; Banks registered under the Banking and Financial Institutions Act up to K250,000,000 – 35%; income in excess of K250,000,000 – 45%, farming – 15%; non-traditional exports – 15%; charitable organization – 15%; companies under the ZDA act – 0% first 5 years, 50% reduced rate years 6-8, 25% reduced rate years 9 and 10.[49]
Accounting Standards	Accrual basis
Thin Capitalization Rules	Thin-capitalization rules apply to thinly capitalized companies and the ratio of debt-to-equity should not exceed 3:1.[50] Interest from loans exceeding the 3:1 debt-to-asset ratio is not deductible for mining companies.[51]

[49] Zambia Revenue Authority. http://www.zra.org.zm/Tax_Rates.php
[50] Grant Thornton. A Guide to Establishing a Presence in South Africa. April 2009. http://www.gt.co.za/files/eapsa2009.pdf
[51] Deloitte. International Tax and Business Guide: Zambia. 2010. http://www.deloitte.com/assets/Dcom-Global/Local%20Assets/Documents/Tax/Intl%20Tax%20and%20Business%20Guides/2010/dtt_tax_highlight_2010_Zambia.pdf

Item	Treatment
Depreciation	Accelerated depreciation is available.[52] Agriculture equipment – 50% straight line basis for the first 2 years. Manufacturing and tourism equipment – 50% straight line basis.[53] Industrial building – Investment Allowance 10% on cost (new industrial building – not deducted from cost – first year only). Initial allowance – 10% on cost (must be deducted from cost – first year only). Subsequent wear and tear allowance 5% on cost. Commercial building – 2% on cost. Plant, machinery and implements (incl. commercial vehicles) – 25% on cost. Non-commercial vehicles – 20% on cost. Commercial vehicles – 25% on cost. Implements, machinery and plant used directly and exclusively in farming, manufacturing, leasing and tourism businesses – 50% on cost.[54]

[52] Ministry of Mines and Mineral Development. http://www.zambiamining.co.zm/tax-incentives.htm
[53] Zambia Development Agency. http://www.zda.org.zm/196-priority-sectors
[54] Southern African Development Community. http://www.sadc.int/tifi/tax/chapter/1/country/zambia

1. II. Indirect Tax

Item	Description
Value-Added Tax	Standard VAT rate of 16%.[55]
Customs duties	Levy/tax charged on imported goods at the following rates: 0-5% Capital Equipment and Raw Materials 15% Intermediate Goods 25% Finished Goods Customs Duty is charged on the Customs Value.[56] Rebates, refunds or remissions for part or full customs duty for holders of mining rights.[57] Cash accounting is mandatory for companies carrying on mining operations.[58] A 15% Export Duty on concentrate was imposed in 2008 but subsequently repealed.
Excise Duty	Excise Duty is a tax on particular goods or products whether imported or produced domestically, imposed at any stage of production or distribution, by reference to weight, strength or quantity of the goods or products, or by reference to their value. Excise Duty is charged on the Excisable Value i.e. Customs Value + Customs Duty.[59]

[55] Deloitte. International Tax and Business Guide: Zambia. 2010. http://www.deloitte.com/assets/Dcom-Global/Local%20Assets/Documents/Tax/Intl%20Tax%20and%20Business%20Guides/2010/dtt_tax_highlight_2010_Zambia.pdf
[56] Zambia Revenue Authority. http://www.zra.org.zm/TaxesAdministered.php
[57] Ministry of Mines and Minerals Development. http://www.zambiamining.co.zm/tax-incentives.htm
[58] Deloitte. International Tax and Business Guide: Zambia. 2010. http://www.deloitte.com/assets/Dcom-Global/Local%20Assets/Documents/Tax/Intl%20Tax%20and%20Business%20Guides/2010/dtt_tax_highlight_2010_Zambia.pdf
[59] Ministry of Mines and Minerals Development. http://www.zambiamining.co.zm/tax-incentives.htm

Table 2
International Comparison of Mineral Royalties

2. I. Royalty Rates for Metals

Mineral	*Country*	*Rate*	*Definition of Base*
Aluminum	Australia (NSW)[a] Australia (NT)[a]	AUD[b] 0.35 18%	Per ton of bauxite Net value of mineral
	Canada (BC)[a] Canada (Sask.)[a]	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	unclear	
	China	2% + per unit charge	Ad valorem royalty + per unit charge
	DRC[a]	2%	Net sales value
	Indonesia	3.75%	Net sales of bauxite
	Kazakhstan	0.28%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5%	Sales value
	Peru	1-3%[c]	Gross sales value
	Russia	8%	Value of mineral resources
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	US (AZ)[a] US (NV)[a]	At least 2% Up to 5%	Gross value Net proceeds

Mineral	*Country*	*Rate*	*Definition of Base*
Copper	Australia (NSW) Australia (NT)	4% 18%	Ex-mine value Net value of mineral
	Canada (BC) Canada (Sask.)	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	0-5%[c]	Total sales, varies by volume
	China	2% + Rmb[b] 7/ton	Ad valorem royalty + per unit charge
	DRC	2%	Net sales value
	Indonesia	4%	Net sales
	Kazakhstan	5.7%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5% (base rate)	Sales value
	Peru	1-3%[c]	Gross sales
	Russia	8%	Value of mineral resources
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	US (AZ) US (NV)	At least 2% Up to 5%	Gross value Net proceeds
	Zambia	3% (6% in 2012)	Gross value

Mineral	*Country*	*Rate*	*Definition of Base*
Gold	Australia (NSW) Australia (NT)	4% 18%	Ex-mine value Net value of mineral
	Canada (BC) Canada (Sask.)	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	unclear	
	China	4% + per unit charge	Ad valorem royalty + per unit charge
	DRC	2.5%	Net sales value
	Indonesia	3.75%	Net sales
	Kazakhstan	5.0%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5%	Sales value
	Peru	1-3%[c]	Gross sales
	Russia	8% (6% concentrate containing gold)	Value of mineral resources
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	US (AZ) US (NV)	At least 2% Up to 5%	Gross value Net proceeds
	Zambia	5%	Gross value

Mineral	*Country*	*Rate*	*Definition of Base*
Iron	Australia (NSW) Australia (NT)	4% 18%	Ex-mine value Net value of mineral
	Canada (BC) Canada (Sask.)	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	unclear	
	China	n/a	Ad valorem + per unit charge
	DRC	0.5%	Net sales value
	Indonesia	3%	Net sales
	Kazakhstan	2.8%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5%	Sales value
	Peru	1-3%[c]	Gross sales
	Russia	4.8%	Value of mineral resources
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	US (AZ) US (NV)	At least 2% Up to 5%	Gross value Net proceeds

Mineral	*Country*	*Rate*	*Definition of Base*
Zinc	Australia (NSW) Australia (NT)	4% 18%	Ex-mine value Net value of mineral
	Canada (BC) Canada (Sask.)	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	unclear	
	China	2% + Rmb 20/ton	Ad valorem + per unit charge
	DRC	2%	Net sales value
	Indonesia	3%	Net sales
	Kazakhstan	7%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5%	Sales value
	Peru	0-3%[c]	Gross sales
	Russia	8%	Value of mineral resources
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	US (AZ) US (NV)	At least 2% Up to 5%	Gross value Net proceeds

Notes:

a. NSW =New South Wales (Australia); NT = Northern Territory (Australia); BC = British Columbia (Canada); Sask. = Saskatchewan (Canada); DRC = Democratic Republic of the Congo; AZ = Arizona (USA); NV = Nevada (USA).

b. AUD = Australian Dollars 1 AUD = 1.00 USD; Rmb = China Yuan Renminbi 1Rmb = 0.15 USD (as of 24 January 2011 http://www.xe.com/ucc/)

c. Peru: 2010 proposal to double rates for most minerals to 2-6%, copper to 5%, gold to 10%; unclear when effective. Chile: temporary increase on copper royalty rate up to 9% for 2011 and 2012.

2. II. Royalty Rates for Industrial Minerals

Mineral	*Country*	*Rate*	*Definition of Base*
Industrial minerals	Australia (NSW)[a] Australia (NT)[a]	AUD[b] 0.40, 0.70 18%	Per ton Net value of mineral
	Canada (BC)[a] Canada (Sask.)[a]	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	unclear	
	China	n/a	Ad valorem + per unit charge
	DRC	1%	Net sales value
	Indonesia		
	Kazakhstan	2-5.6%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5%	Sales value
	Peru	1-3%[c]	Gross sales
	Russia	unclear	
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	US (AZ)[a] US (NV)[a]	At least 2% Up to 5%	Gross value Net proceeds
	Zambia	2%	Gross value

Mineral	*Country*	*Rate*	*Definition of Base*
Phosphate	Australia (NSW) Australia (NT)	AUD 0.70 18%	Per ton Net value of mineral
	Canada (BC) Canada (Sask.)	15% 5/10%	2% net current proceeds + 13% net revenue Net profits based on unit sales
	Chile	unclear	
	China	n/a	Ad valorem + per unit charge
	DRC	2%	Net sales value
	Indonesia	n/a	
	Kazakhstan	4%	Mineral Extraction Tax based on revenue
	Mexico	None	None
	Mongolia	5%	Sales value
	Peru	1-3%[c]	Gross value
	South Africa	Unrefined: 0.5+(EBIT/(gross sales*9))*100, max 7% Refined: 0.5+(EBIT/(gross sales*12.5))*100, max 5%	EBIT = Earnings Before Income Taxes and Gross sales
	Russia	n/a	
	US (AZ) US (NV)	At least 2% Up to 5%	Gross value Net proceeds
	Zambia	3%	Gross value

Notes:

a. NSW =New South Wales (Australia); NT = Northern Territory (Australia); BC = British Columbia (Canada); Sask. = Saskatchewan (Canada); DRC = Democratic Republic of the Congo; AZ = Arizona (USA); NV = Nevada (USA).

b. AUD = Australian Dollars 1 AUD = 1.00 USD (as of 24 January 2011 http://www.xe.com/ucc/)

c. Peru: 2010 proposal to double rates for most minerals to 2-6%.

Table 3
International Comparison of Profits Tax Policy

Item	*Country Treatment*	
Rate	• Australia: 30% • Canada: federal rate 18% in 2010, 16.5% in 2011 (BC 10.5% in 2010, 10% in 2011; Sask. 10%)[a] • Chile: 20% First Category Tax + Global Complementary + Additional Tax on Non-residents • China: 25% • DRC: 40%; 30% for mining companies • Indonesia: 25% • Kazakhstan: 20%; branch profits tax of 15% • Mexico: 30% • Mongolia: 10% up to MNT[b] 3 billion; 25% thereafter • Peru: 30% • Russia: 20% • South Africa: 28%; branch profits tax of 33% • United States: 15-35% on residents/ 30% branch profits tax (AZ 6.97%, NV – no tax)[a] • Zambia: 35%; 30% for mining companies + 0-15% variable profits tax	
Treatment of Exploration Expenses	**Immediate Expensing**	**Amortized**
	• Australia • Canada • Chile • Kazakhstan • Russia • South Africa • Zambia	• China • Indonesia • Mongolia: pre-production 5 yrs SL[c] • US: 70% first year, then 5 yrs SL
Treatment of Development Expenses	**Immediate Expensing**	**Amortized**
	• Australia • Canada • Chile • DRC • Kazakhstan • South Africa • Zambia	• China • Indonesia • Mongolia: 5 yrs SL • Russia: over 5 yrs • US: 70% first year, then 5 yrs SL

Table 3
Profits Tax (continued)

Item	*Country Treatment*	
Thin Capitalization	**Yes**	**No**
	• Australia: 3:1 debt-to-asset ratio • Canada: 2:1 debt-to-asset ratio • Chile: 3:1 debt-to asset ratio • China: 5:1 debt-to-asset ratio for financial institutions; 2:1 in all other cases • Indonesia: no specific rules • Kazakhstan: specific formula[60] • Mexico: 3:1 debt-to-asset ratio • Peru: 3:1 debt-to-asset ratio • Russia: 3:1 debt-to-asset ratio • South Africa: 3:1 debt-to-asset ratio • US: 1.5:1 debt-to-asset ratio • Zambia: 3:1 debt-to-asset ratio	• DRC (or not known)

[60] The thin capitalization rules limit the deduction of interest according to the following formula:
(A+ E)+(AC/AL)*(MC)*(B+C+D) where:
A = interest exceeding amounts in B, C, D and E;
B = interest paid to a related party, except amounts in E;
C = interest paid to tax haven entities, except amounts in B;
D = interest paid to an independent party on loans provided under deposit or guarantee, bail or any other form of guarantee by related parties, if the guarantee or other form of guarantee is executed, except amounts in C;
E = interest paid on loans (credits) provided by a Kazakh credit partnership;
MC = marginal coefficient (As from 2012, the marginal coefficient for financial organizations will be seven and four for other legal entities);
AC = average annual equity capital; and
AL = average annual liabilities. (Deloitte. International Tax and Business Guide p. 12.)

Item	*Country Treatment*
Depreciation of Mining Assets	• Australia: prime cost or diminishing value • Canada: 30% DB[c] for mining assets • Chile: accelerated method available for some equipment • China: typically 10% SL • DRC: DB, variable rates depending on asset type • Indonesia: DB or SL • Kazakhstan: 15% for oil and gas wells, transmission facilities, machines and equipment for oil and gas production • Mexico: SL adjusted for inflation • Mongolia: 10 years SL • Peru: 3% SL building, 20% SL equipment • Russia: 1-15 years SL or DB • South Africa: 10 years for oil pipelines, accelerated depreciation available • United States: 7% DB • Zambia: SL
Special Incentives	• Australia: investment allowances, R&D concessions • Canada: investment incentives, resource allowance, accelerated capital cost allowance • Chile: investment incentives • China: special zones, R&D incentives, tax holidays • DRC: incentives for new companies • Indonesia: accelerated depreciation, investment allowance • Kazakhstan: accelerate tax deduction for special economic zones • Mexico: none specific to mining • Mongolia: investment tax credit, tax stabilization agreements • Peru: tax holiday, tax stabilization agreements • Russia: accelerated depreciation, special zones • South Africa: royalty exemption, accelerated depreciation • United States: percentage depletion allowance, R&D credit • Zambia: lower tax rate for large-scale mining, 100% mining deduction on certain capital expenditures

Table 3
Profits Tax (continued)

Item	*Country Treatment*	
Ring Fencing	***Yes***	***No***
	• China • Indonesia (contracts of work) • Kazakhstan • Peru • South Africa	• Australia • Canada • Chile • Mexico • Mongolia • Russia • United States • Zambia

Notes:

a. BC = British Columbia (Canada); Sask. = Saskatchewan (Canada); AZ = Arizona (US); NV = Nevada (US)
b. MNT = Mongolia Tugrik 1 MNT = 0.0008 USD; PEN = Peru Nuevos Soles 1 PEN = 0.361 USD (as of 24 January 2011 http://www.xe.com/ucc/)
c. SL = straight line depreciation method; DB = declining balance depreciation method.

Table 4
International Comparison of Excess Profits Tax, Equity Participation, Withholding & Other Matters

Item	*Country Treatment*	
Excess Profits Tax	**Yes**	**No**
	• Kazakhstan: 0-60% on portion of net income that exceeds 25% of deductions • Australia introduced a type of Resource Rent Tax in November 2011. Rate will be 30% on a measure of the net present value. • Mongolia: New variable royalty based on price introduced January 2011. Rates vary from 5% to 15% when output is concentrated. • Zambia: 0-15% variable profits tax on copper producer	• Australia • Canada • Chile • China • DRC • Indonesia • Mexico • Peru • Russia • South Africa • United States • Zambia (under review)
Equity Participation for Government	**Yes**	**No**
	• DRC: 17.5-25% government equity ownership in mining; proposals to increase portion to 24-45% • Mongolia: 10% local equity requirement, up to 50% government equity for state/private investments, up to 34% government equity for foreign investments • Peru: 8% workers profit share • South Africa • Zambia: government minority interest in most privatized large copper companies 87.5%	• Australia • Canada • Chile • China • Indonesia • Kazakhstan • Mexico • United States

Table 4
Excess Profits Tax, Equity Participation, Withholding & Other Matters (continued)

Item	*Country Treatment*
Withholding Tax	**Dividends**
	• Australia: 30% (if out of previously untaxed income) • Canada: 25% • Chile: 35% • China: 10% • DRC: 20%; 10% for mining companies • Indonesia: 10% residents / 20% non-residents • Kazakhstan: 15% non-residents / 20% residents in tax haven • Mexico: no withholding • Mongolia: 20% • Peru: 4.1% • Russia: 9% resident, 15% non-resident • South Africa: no withholding, 10% Secondary Tax on Companies • United States: 30% • Zambia: 15%, 0% mining
	Interest
	• Australia: 10% • Canada: 25% • Chile: 35%, 4% if loan is granted by foreign bank • China: 10% + 5% business tax • DRC: 20%; 10% for mining companies • Indonesia: 15% residents / 20% nonresidents • Kazakhstan: 15% non-residents / 20% residents in tax haven • Mexico: 30%, 4.9% interest paid to nonresident bank, 40% to low-tax country related party • Mongolia: 20% • Peru: 30%, 4.99% to nonresident related party • Russia: 20% non-resident • South Africa: None • United States: 30% • Zambia: 15%

Table 4
Excess Profits Tax, Equity Participation, Withholding & Other Matters (continued)

Item	*Country Treatment*
Withholding Tax (continued)	**Payments for Services to Nonresidents**
	• Australia: 5% • Canada: 25% • Chile 10% • China: n/a • DRC: n/a • Indonesia: 2% • Kazakhstan: 20% • Mexico: 25% • Mongolia: 20% • Peru: 15% technical assistance / 30% independent professionals • Russia: 0% • South Africa: n/a • United States: 30% non-treaty countries, 0-15% treaty countries • Zambia: 15%
	Royalties
	• Australia: 30% • Canada: 25% • Chile: 30% • China: 10% • DRC: 20%; 10% for mining companies • Indonesia: 15% residents / 20% nonresidents • Kazakhstan: 15% non-residents / 20% residents in tax haven • Mexico: 28% • Mongolia: n/a • Peru: 30% • Russia: 20% • South Africa: 12% • United States: 30% • Zambia: 15%

Item	*Country Treatment*
Indirect Tax (VAT)	• Australia: standard GST rate 10% • Canada: standard GST rate 5% (BC 12%, Sask. 5%) • Chile: standard VAT rate 19% • China: standard VAT rate 17% (gold exempt) • DRC: 13% sales tax (10 or 3% for mining companies) • Indonesia: standard VAT rate 10%, pre-production purchases of machinery and equipment are VAT-exempt • Kazakhstan: standard VAT rate 12% • Mexico: standard VAT rate 16% • Mongolia: standard VAT rate 10% • Peru: standard VAT rate 19% • Russia: standard VAT rate 18% • South Africa: standard VAT rate 14% • United States: states and localities may impose sales tax • Zambia: standard VAT rate 16%

Table 4
Excess Profits Tax, Equity Participation, Withholding & Other Matters (continued)

Item	*Country Treatment*	
Import Duties	**Taxed**	**Exempt**
	• Australia: 5% general rate • Chile: 10% on mine equipment • Mongolia: 5% on mine equipment • Indonesia • Kazakhstan • Peru: 0-17% • Russia: 0-25% of customs value (oil drilling platform 15%) • South Africa • United States: import duties vary by country and commodity • Zambia	• Canada: most minerals • China • DRC: mining companies • Mexico: exempt if they are used in production of exports
Export Duties	**Taxed**	**Exempt**
	• Russia: 35-65% on minerals	• Australia • Canada • Chile • China • DRC (for mining companies) • Indonesia • Kazakhstan • Mexico • Mongolia • Peru • South Africa • United States

Table 4
Excess Profits Tax, Equity Participation, Withholding & Other Matters (continued)

Item	*Country Treatment*
Other Matters	**Type of entities allowed in mining**
	• Australia: no apparent restrictions • Canada: no apparent restrictions • Chile: no apparent restrictions • China: no apparent restrictions • DRC: no apparent restrictions • Indonesia: no apparent restrictions • Kazakhstan: no apparent restrictions • Mexico: no apparent restrictions • Mongolia: no apparent restrictions • Peru: • Russia: no apparent restrictions • South Africa: no apparent restrictions • United States: no apparent restrictions • Zambia: no apparent restrictions

Table 5
Summary of Potential Government Functions in the Natural Resource Sector

Function	Financial Payments to Government	Financial and Opportunity Costs
Ownership Function (Stewardship of the Reserve Base)	Financial returns to ownership • Bonus • Auction Bids • Royalties (including variable royalties) • Excess Profit Schemes	• Reduction in wealth via accumulated extraction • Lost diversification
General Tax Function	• Personal Income Tax • Profits Tax • VAT • Tariffs • Property Tax	• Distortions in private sector decision making • Administrative and compliance costs
Passive Investment Function	• Dividends • Capital Gains • Interest (if passive investment is via loans) • Price Participation Agreements	• Less diversification (both domestic and international) given investment budgets • Foregone current government expenditures (such as debt reduction or education)
Operating Company	• Returns to management (in addition to dividends and capital gains)	• Further losses in diversification • Lost efficiency in public sector enterprises

Table 6
Mining Sector Revenue by Type of Charge and Relevant Ratios (1)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Company Tax (2)	8.00	-	-	-	-	2.00	2.00	1.00	-	-	1.00	160.00	603.00	464.00	401.00	1,244.48(3)	2,477.03(3)
Withholding Tax / Dividends	-	-	-	-	-	-	-	-	1.00	2.00	3.00	-	-	-	-		
Mineral Royalty	29.00	17.00	19.00	17.00	13.00	4.00	7.00	3.00	8.00	4.00	39.00	59.00	68.00	238.00	235.00	412.00	857.15
Export Duty	-	-	-	-	-	-	-	-	-	-	-	-	-	178.00	15.00		
Windfall Tax	-	-	-	-	-	-	-	-	-	-	-	-	-	126.00	-		
Mining Revenue Total	37.00	17.00	19.00	17.00	13.00	6.00	9.00	4.00	9.00	6.00	43.00	219.00	671.00	1,006.00	651.00	1,656.48	3,334.17

(1) Nominal Million Kwacha – Source: Zambia Revenue Authority

(2) Variable Profit Tax Included after 2008

(3) Includes Lump Sum Settlements for disputed taxes arising from imposition of new royalty, windfall tax and variable profit tax

(4) GDP is believed to be underestimated in Zambia and in other mining countries because of valuation methodologies employed for mineral exports and production more generally.

Table 7
Importance of Mining in GDP and in Total Government Revenue (5)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Nominal GDP*(4)	3,005.10	3,950.20	5,140.20	6,027.90	7,477.70	10,121.30	13,193.70	16,324.40	20,551.10	25,993.10	32,041.50	38,560.80	46,194.80	54,839.44	64,615.58	77,666.59	93,963.82 (6)
Mining GDP*	432.90	476.80	510.90	378.30	281.30	416.10	518.90	575.10	564.80	809.60	1,030.90	1,612.50	2,037.20	1,998.94	1,682.14	2,837.77	3,825.36
Ratio of Mining Value Added to GDP	14.41%	12.07%	9.94%	6.28%	3.76%	4.11%	3.93%	3.52%	2.75%	3.11%	3.22%	4.18%	4.41%	3.65%	2.60%	3.65%	4.07%
Ratio of Total Revenue from Mining to Mining GDP	8.55%	3.57%	3.72%	4.49%	4.62%	1.44%	1.73%	0.70%	1.59%	0.74%	4.17%	13.58%	32.94%	50.33%	38.70%	58.37%	87.16%

(5) Nominal Million Kwacha – Source: Zambia Revenue Authority – See Notes to Table 6

(6) Preliminary

Table 8
Shares by Type of Payment to Total Mineral Revenue

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Company Tax	21.62%	0.00%	0.00%	0.00%	0.00%	33.33%	22.22%	25.00%	0.00%	0.00%	2.33%	73.06%	89.87%	46.12%	61.60%	75.13%	74.29%
Withholding Tax/Dividends	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	33.33%	6.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Mineral Royalty	78.38%	100.00%	100.00%	100.00%	100.00%	66.67%	77.78%	75.00%	88.89%	66.67%	90.70%	26.94%	10.13%	23.66%	36.10%	24.87%	25.71%
Export Duty	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.69%	2.30%	0.00%	0.00%
Windfall	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.52%	0.00%	0.00%	0.00%
Total Mining Revenue	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Table 9
Mineral Revenue Share by Type of Charge

Percentage of Mining Tax to Total Collections by Type of Tax					
Year	**2005**	**2006**	**2007**	**2008**	**2009**
Company Tax	0.22%	23.02%	49.30%	34.29%	29.14%
Withholding Tax/Dividends	1.25%	0.00%	0.00%	0.00%	0.00%
Mineral Royalty	100.00%	100.00%	100.00%	100.00%	100.00%
Export Duty	0.00%	0.00%	0.00%	93.68%	88.24%
Windfall	100.00%	100.00%	100.00%	100.00%	100.00%
Mining Revenue Total	0.78%	3.46%	8.20%	10.54%	6.74%

Table 10
Policy and Implementation Checklist

A. **Royalty**

Item	Issue	Zambia's Current Policy	Recommendation
1	How is it computed?	Ad valorem at 3%.6%?	Maintain current policy.
2	What is the value used to compute the royalty?	LME Price (monthly average).	Maintain current policy.
3	How is output measured?	Depends on producer. Output could be finished product, concentrate or ore.	Move measurement point as far upstream as possible and, at a minimum, standardize the unit of measure across producers.
4	Is there an independent audit of production?	Not clear.	Require audits and control. Mines should be treated like bonded warehouses for the excise tax. There should be independent audits of volumes and tests for quality, complete with transparent dispute resolution procedures.
5	Is there free flow of information between departments?	Not clear.	If geologists and engineers are not assigned to the ZRA, then there should be greater information flows between the ZRA, Ministry of Mines and the Central Bank.

B. Profits Tax

Item	Issue	Zambia's Current Policy	Recommendation
1	What are the valuation rules for output?	Depends on the producer. Claim that LME price is used for related party transactions.[61] Arm's-length pricing is claimed to be used for other producers.	Continue to use quality-adjusted deemed price for output for related parties. Begin organization of a comparative database on prices used by mineral-producing countries, processing costs, transport costs, and other relevant data. Begin to develop standard pricing models that can be used to trigger audits. Hedging should be either treated on a mark-to-market basis or limited so that only hedging losses may offset gains.
2	What methods are used to measure input values between related parties?	Not clear.	Review major cost classifications besides interest (technological royalties, management fees, purchases of goods and services). Establish rules (which might be maximums subject to inflation adjustments or OECD standards depending on ability to administer). Establish monitoring systems so that system can evolve through time.

[61] The use of the LME price means that quality-adjusted deemed total revenue will be greater than under any other economic standard because the LME price, quality adjusted, is higher than the fob price at Zambia's border. Tax officials claim that at least one domestic fabricator buys final output from domestic sources at the LME price and thus are hesitant to use lower prices for final output from domestic smelters. The fact that one domestic fabricator pays the LME price may be an indicator of domestic market power because the opportunity cost to the fabricator is the lesser of the cif price of smelter output (LME plus transportation) from another source or the price charged by another domestic producer. Domestic suppliers' opportunity cost would be the greater of the price to domestic producers or the fob border price (LME less transportation cost for instance). Clearly, domestic smelters would be willing to sell all output at the LME price (risk adjusted), other things equal.

Item	Issue	Zambia's Current Policy	Recommendation
3	What are the thin capitalization rules?	Interest attributable to debt in excess of a debt-to-equity ratio of 3-to-1 is disallowed.	If this provision is maintained, then: • Clearly define debt and assets for the purposes of the test, • Monitor intra-firm interest rates, and • Create a stacking rule for the ordering of debt subject to the limitation.
4	How are exploration and development expenses treated?	Expensed.	Capitalize and amortize via either cost depletion or declining balance methods.
5	Are there ring fencing provisions?	No.	Maintain current policy if exploration and development are capitalized. Consider ring fencing if tax provisions provide significant opportunity for losses.
6	What are the withholding tax rules?	None for dividends. Positive for other payments.	Either impose a withholding tax on dividends or establish a dividend tax account where a compensating tax is imposed to ensure that 100% of dividends are distributed on a tax-paid basis.

C. Variable Royalty (Windfall Charge – Excess Price Charge)

Item	Issue	Zambia's Current Policy	Recommendation
1	How is the charge computed?	Trigger is ratio of net-of-tax profits to total sales in excess of 8%.	Repeal and replace. If maintained, then either: • Change the numerator of the fraction to income before interest and taxes, or • Lower the trigger rate to less than 8%, and • Develop rules for defining both the numerator and denominator.
2	What is the alternative?	Trigger is based on LME price.	Use one additional rate, at least initially. Set the initial trigger rate at one standard deviation above the historical LME price adjusted for inflation (and revise annually). Computation will then be identical to the royalty computation.

D. Equity Participation

Item	Issue	Zambia's Current Policy	Recommendation
1	What rights do minority shareholders have?	Not clear.	Ensure that minority shareholders have the right to audit and to ensure that transfer pricing methods are not used to the detriment of minority shareholder interest.
2	What are the reporting requirements?	Not clear.	Require ZCCM-IH to publish all receipts by source and type (dividend, price participation agreements and other payments). Require publication of all ZCCM-IH contracts and agreements. Require independent published audits by internationally-recognized audit firms using Generally Accepted International Accounting Principles. Force distribution of 100% for ZCCM-IH's free cash flow less a minor percentage for cash reserves.
3	Are there investment rules?	ZCCM-IH may make incremental investments.	ZCCM-IH should be maintained as a holding company and should not be allowed to make any investments, at least without public review and approvals.
4	Is there an independent audit of production?	Not clear.	Should require audits and control. Mines should be treated like bonded warehouses for the excise tax. There should be independent audits of volumes and tests for quality complete with transparent dispute resolution procedures.
5	Is there free flow of information between departments?	Not clear.	If geologists and engineers are not assigned to the ZRA, then there should be greater information flows between the ZRA, Ministry of Mines and the Central Bank.

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