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Responsible Mining

Mining Legislation Reform Initiative

Analysis of Armenia's mining fiscal regime

Matthew Genasci
Mining Policy Group, New York, U.S.A.

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About This Series and MLRI

This *Analysis of Armenia’s mining fiscal regime* is prepared within the scope of the **Mining Legislation Reform Initiative (MLRI)**, a project of the **AUA Center for Responsible Mining**. MLRI is a multi-year effort, funded by the **Tufenkian Foundation**, to improve Armenia’s legislation ensuring that mining in Armenia provides sufficient benefits to the country and local communities. The initiative involves drafting and passing legislation that elevates the socio-economic benefits of mining, while reducing the negative environmental and public health impacts. A key component of the MLRI is collaborating and partnering with civil society, advocacy groups, academic institutions, and relevant national and international organizations. MLRI works with the key governmental and legislative bodies in getting the draft legislation passed into law. For more information visit <http://mlri.crm.aua.am>.

About the AUA Center for Responsible Mining

The American University of Armenia (AUA) Center for Responsible Mining promotes the creation and adoption of global best practices in socially, environmentally, and economically responsible Mining in Armenia and the region. To achieve this, the Center conducts research, training, and advocacy engaging all key stakeholders including industry, civil society, financial institutions, and the public sector. For more info, visit <http://crm.aua.am>.

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I. Introduction

The objective of this working paper is to examine Armenia’s fiscal regime for mineral extraction and to serve as a reference and discussion document in the context of anticipated policy and legislative reform dialogue focused on the structure of Armenia’s legal and fiscal framework for mining. Part II of the paper begins with brief discussion of key principles for mineral taxation, including a general discussion of key terminology and concepts, common government objectives and policy considerations, and fiscal instruments used internationally. Part III gives a brief overview of the mining sector in Armenia, while Part IV of the paper provides a detailed description of Armenia’s fiscal regime, noting key elements and calculation methodologies and flagging areas of uncertainty for further investigation. The description of the fiscal regime included in Part IV serves as the basis for the legal and economic analysis that follows. Part V provides an international comparative analysis of Armenia’s fiscal regime, as well as a detailed legal and economic analysis.¹ The analysis looks individually at each of the main elements of the fiscal regime before presenting an analysis of the regime as a whole based on economic modeling of a representative mining project. The modeling is based on the set of assumptions described in Table 2, and a description of the fiscal regimes used for comparison is provided in Annex 2. A brief summary of recommendations (Part VI) concludes the analysis.

II. Mining Fiscal Regimes

The term “Mining Fiscal Regime” refers to the set of instruments used by mineral producing states that determines how revenues generated by mining, oil and gas projects are shared between the state and investors. The term “Tax Regime” may also be used, though this can confuse things as certain important elements of the fiscal regime are not true taxes (e.g., royalties) and should not be analyzed as such. This Part II provides an overview of both the principles underlying global mining fiscal regimes and the elements commonly observed in such fiscal regimes.

¹ This report has been prepared at the request of the Mining Legislation Reform Initiative (MLRI), a project of AUA Center for Responsible Mining, in order to inform debate around the fiscal regime for mining in Armenia. The author is a lawyer and policy analyst specializing in the taxation of extractive resources. The author is not licensed to practice law in Armenia and has no special expertise in Armenian law or the Armenian mining sector. This report is therefore based on general policy principles and the author’s experience working on general and mining-specific fiscal policy in a large number of countries; no part of this report shall be considered legal advice and the author assumes no liability for any reliance on the analysis herein for any purpose. The analysis is based upon the description of the fiscal regime presented herein, which has been prepared with the assistance of MLRI and in reliance on various primary and secondary sources; no representation is made as to any errors or omissions in the description of the relevant laws, any of which may impact upon the conclusions drawn in this report. The opinions expressed in this working paper are the author’s alone and shall not be ascribed to anyone associated with the MLRI without their express consent. The author has no relationship with the MLRI outside of the preparation of this paper and has no direct knowledge of the views of MLRI staff on issues covered herein, or any other area of mining policy in Armenia.

Principles of Mineral Taxation

The way in which a country manages its mineral resources can have a tremendous impact on its development path. The large potential rents² present in mining mean that the potential financial returns to the resource owner (the state) can be transformative. While significant non-fiscal benefits can accrue from mining (e.g., employment, infrastructure improvements, linkages between the mining sector and other segments of the economy, etc.), the capture and utilization of resource revenues represent the greatest potential benefit of mining in many countries.

Resource rents can differ substantially from project to project and mineral to mineral, and measuring them is a challenge. As a principle of tax policy, fiscal regimes that are progressive overall—meaning that they capture a greater share of revenues when profits are higher—are preferable to fiscal regimes that are regressive. Regressive fiscal regimes may put excessive burdens on projects with low profit margins, potentially preventing them from moving forward. They may also result in politically unacceptable returns for the government during periods of high profitability. It is important to note that most fiscal regimes will be made up of a combination of progressive and regressive instruments, and there may be good arguments for including some of these regressive instruments; it is thus best to evaluate the fiscal regime as a whole.

An important feature of mineral resources is that they are finite and exhaustible. Thus, there is a cost to extraction in that extracting resources now means they will not be available to extract in the future. Their extraction represents a permanent loss of valuable assets; if this reduction is not adequately offset by financial and other benefits, mining can result in a net decrease in national wealth. The exhaustibility of natural resources has implications for the design of the fiscal regime. For instance, pure reliance on profit-based mechanisms—which would satisfy the objective of having a progressive regime—can theoretically result in the permanent loss of mineral wealth with little to no compensating financial payment when profits are low. Some balance between different types of fiscal tools is thus preferable for most states.

A well-designed fiscal regime should support the broader policy objectives of the state. If revenue mobilization is assumed to be the primary policy objective, then fiscal regimes should seek to maximize the present value of net government revenues from the resource endowment. Of course, revenue mobilization may be appropriately balanced with other objectives, such as encouraging the development of local downstream processing industries, or seeking to benefit from economic spillovers through increased local employment and procurement, or encouraging exploration in the hopes that revenue foregone in the short term will be compensated by greater revenues from an expanded mining sector in the future. Because these and other objectives may be reasonably pursued by the government, some

² “Economic rent” refers to the surplus value remaining after costs of production and the minimum required return to capital are paid.

care must be taken in analyzing fiscal regimes purely in terms of the revenue flows they generate.

While some states have, at various times, developed their hard mineral resources on their own, most states rely on private sector investors to bring the technical expertise and capital necessary to convert subsoil resources into productive mines. Thus, fiscal regimes must strike a balance between the imperative of maximizing the present value of government revenues and the need to provide sufficient economic incentives to investors.

A central concern for investors in relation to mineral fiscal regimes relates to the *time consistency* problem. Mining projects are location specific, involve high sunk costs and can have very long project timelines. Thus, governments may decide to offer significant fiscal concessions to attract investment, but once investments are made they may face incentives to renegotiate the arrangements to make them more favorable to the state. Investors recognize these shifting incentives and try to protect themselves in a variety of ways (e.g., contractual stabilization of the fiscal regime). They also prefer regimes that shorten the period of time before investment capital is paid back. In general, fiscal regimes designed to minimize incentives for either party to renegotiate—e.g., by responding to changing circumstances—will generally be advantageous to both investor and state. This notion of responding to changing circumstances is particularly important for mining because it is an industry beset by a high degree of uncertainty, including uncertainty of minerals prices, mineral endowments and geology, input costs, and political risk.

There are significant differences between mineral rich countries that impact on fiscal policy. Countries with large resources and a long time horizon for production will have different policy priorities than countries with anticipated short production horizons. Countries that are highly dependent on mineral revenues will have different priorities than those with more diversified economies. Countries with greater uncertainty around the resource base, cost structure, or political situation may also need to adapt their fiscal regimes in order to effectively compete for limited investment capital.

An important feature of any mineral fiscal regime is the degree to which it lends itself to effective administration, and thus simplicity is a central principle for the design of mineral fiscal regimes. Even the most well designed mineral fiscal regime will present unique challenges for tax administration, though some fiscal charges are inherently more difficult to administer than others. At one end of the spectrum, bonus payments are the most easily administered, followed by volume-based charges (e.g., some fixed fee per ton of production, rather than an *ad valorem* charge). *Ad valorem* royalties are also considered to be among the easier charges to implement, particularly where they are based on published prices and do not require significant levels of cost accounting. The most complex charges are the various profit-based and cash-flow based taxes, as both income and cost measurement present numerous challenges. Of course, some of the most easily administered charges tend to be the most regressive as well, so a balance must be found. The common sense principle of simplicity dictates that a fiscal regime should be no more complicated than it needs to be to accomplish its objectives. This is to the benefit of both the government and investors, for whom

compliance costs and the administrative inefficiency that can accompany complex rules can have a significant impact.

There has been some debate within the policy community in recent years about whether reliance on highly progressive profit- and rent-based taxes is appropriate for countries with capacity constraints in tax administration in light of the generally greater challenges that such tools present. Administrative difficulty alone should not be the basis for ruling such taxes out, but efforts should be made to both minimize these challenges where possible and to build administrative capacity where necessary.

Overview of Common Elements

Royalties. A royalty is a charge levied by the resource owner (in most cases the state) on the extraction of minerals. Royalties may be charged on an *ad valorem basis* (a percentage of value) or on a *unit basis* (a specified charge per unit of weight or volume), with *ad valorem* royalties by far the most common for all but very low value commodities. Nearly all mining jurisdictions levy some form of royalty, though a number of countries use so-called “profit-based royalties”, which may be called royalties but in fact operate as additional taxes on some measure of profits.

The two components of a royalty (or any fiscal tool) are the rate and the base. *Ad valorem* royalty rates for minerals generally fall in the range of 0-9%.³ Comparison of rates between countries must be done carefully, however, because the royalty base also matters, and royalty bases differ considerably. For example, a 4% royalty in a country that sets the royalty base as the *net smelter return* will be much less than a 4% royalty in a country that sets the royalty base as the value of metal contained in ore at the *mine mouth* at international reference prices. The reason for this is that the net smelter return excludes milling and smelting losses from the royalty base, while assessment of value at the mine mouth does not. A variety of other royalty bases are seen in practice. Some countries assess royalties on contracted sales prices of minerals, whereas others use international reference prices that may differ substantially from the prices actually received. Other countries allow transportation, handling, freight and other charges to be subtracted from sales values. It is not always straightforward to determine the base on which a country assesses royalties as terminology is often used imprecisely. It is thus important to look carefully at the specific regulations. As noted above, some countries assess “royalties” not on the value of minerals extracted, but on some measure of profits. In such a case, the base of the royalty may be quite similar to the base for income or profits taxes (which, of course, may be zero in some circumstances).

Some countries—like Armenia, Peru, and South Africa—use variable rate royalties, where the royalty rate increases in relation to some other factor (e.g., mineral prices or company profitability ratios). Variable rate royalties are generally conceived as a means of capturing a greater share of the value of extracted minerals as the price of the mineral and/or the profitability of the company rises. In this sense, they are meant to function in a manner similar

³ “Profit-based” royalties may have rates that are higher than this, but because the *base* for these royalties is generally much lower, direct comparison of the rates of such royalties to the rates of true *ad valorem* royalties is not feasible.

to resource rent taxes or other windfall taxes, though there are several important differences (discussed below).

One reason that royalties are such an important part of most mining fiscal regimes is that they are generally more easily administered than profit-based fiscal tools. A company's ability to manipulate the royalty base—particularly where royalties are based on international reference prices—is substantially more limited than its ability to manipulate its reported taxable income. This relative advantage of royalties is reduced, of course, where the royalty calculation depends heavily on profit measurement and cost accounting for calculation of either the royalty base or, in the case of variable rate royalties, the royalty rate. Another advantage of royalties for governments is that they are typically paid from the outset of production, whereas profit-based elements might not be paid for years.

Income Taxes. Profits taxes exist in all countries and are imposed on most types of investments, including mining. The generally applicable income tax is an important element of the fiscal regime for most mineral producing states, though some jurisdictions include industry-specific provisions that may alter the application of the general rules to the mining sector. As with the royalty, income tax payments are a function of both the tax rate and the rules for measuring the tax base (i.e., taxable income). The rules for calculating taxable income can be highly complex, and a description of all relevant elements of a tax system are beyond the scope of this paper, but a few key elements especially relevant to the mining sector are described below:

- (i) **Treatment of exploration and development expenditures.** Many countries require pre-production expenditures to be capitalized and amortized over some period of time, meaning that the cost of exploration and development does not offset income immediately, but must instead be claimed gradually. Other countries allow for immediate expensing as costs are incurred. Immediate expensing or greatly accelerated depreciation can operate as incentive for companies to invest as they can substantially reduce taxes in the early years of projects. The principal issue is timing (though some countries also offer an “uplift” on development expenditure, resulting in greater than 100% deductions, as an additional incentive).⁴
- (ii) **Thin capitalization rules.** Interest expenditure is generally treated as deductible in income tax systems. For projects that rely heavily on debt financing—such as many mining projects—the size of these interest deductions may substantially reduce taxable income. Even for projects that are 100% equity financed at the parent company level (e.g., where there is no external borrowing), a foreign parent may choose to put its investment into a local subsidiary as debt rather than equity in order to reduce taxes. To prevent excessive reduction of tax through these strategies, most countries use “thin capitalization rules” to limit the amount of interest that can be deducted. These rules generally cap interest rates based on some

⁴ Another potential difference in the treatment of pre-production expenditures is when the depreciation of those expenditures starts. Some countries allow depreciation to commence in the year the expenditures are made, while others dictate that depreciation begins in the first year of production. Where there is a long development phase, the revenue impact of allowing the accumulation of large losses can be significant. Best practice is thus generally to commence deductions upon commencement of production (and to apply a partial year rule, so that a full year of deductions may not be claimed for only a few months of production).

indicator of prevailing rates, and may also cap the amount of debt for which a company can claim interest deductions to some percentage of total assets or equity. Alternatively, thin capitalization rules may limit the total amount of interest deductions to some percentage of an economic benchmark⁵.

- (iii) **Loss carry-forward.** A common principle of income taxation is that allowable expenses be deducted against income to determine taxable income. Where expenses exceed income in any given year, the excess losses are generally carried forward (some countries also allow them to be carried back) to offset future income until they are fully utilized. Many countries place some limits on this carry-forward period, and it is not uncommon for different carry-forward rules to apply to the mining sector.
- (iv) **Ring-fencing.** Ring-fencing refers to application of tax rules on a license-by-license basis, such that the costs attributed to one mining project are not used to offset the profits from another, as would be allowable where taxes are calculated on a consolidated group basis. There may be policy reasons for allowing consolidated taxation (e.g., it may encourage mining companies already present in country to invest in further exploration), but because it has the effect of deferring income taxes on profitable mines, many countries have chosen to tax each mining project as a separate taxable unit (or indeed to require separate incorporation) in order to “ring-fence” each operation.
- (v) **Treatment of hedging.** Mining companies may engage in hedging transactions to protect themselves—or investors—from commodity price movements after commencement of a project. They may, for instance, sell some or all of the gold they produce and mine under long-term contracts that fix the price in reference to the prevailing price at the time project finance was secured. If prices have risen in the meantime, both royalties and income taxes may be reduced absent special rules. Hedging activities can result in taxable gains or losses to companies, but companies operating on a global level have great degree of control over where these gains and losses are realized for tax purposes (e.g., they may enter into offsetting hedges in other jurisdictions). Accordingly, host governments may not wish to be exposed to the tax impacts of these activities. Some mineral rich countries have thus opted to use reference prices as the basis for tax and royalty calculations (effectively disregarding the long-term contract price in the example above) and to treat hedging gains and losses as income and losses from non-mining activities.
- (vi) **Allowable deductions.** It is important for the tax system to establish clear rules for what expenditures may be deducted immediately and which must be amortized over time. The tax deductibility of other fiscal payments should also be clear. In some countries, debate around the mining fiscal regime has focused on the deductibility of royalties, with civil society groups and others sometimes claiming that allowing companies to deduct royalties from taxable income is inappropriate as it reduces taxes that would otherwise be paid. In fact, nearly all countries allow royalties—as well as certain other fiscal payments—to be deducted from income for purposes of the income tax, and this is generally seen as appropriate from an economic perspective. Indeed, there are significant interactions between all elements of a

⁵ The OECD’s recently released guidance on limiting tax base erosion involving interest deductions recommends using a benchmark ratio of net interest to EBITDA (earnings before interest, taxes, depreciation and amortization) (OECD 2015).

fiscal regime, and what is important is that the system as a whole functions well—not that each individual element is maximized.

Rent Taxes and Excess Profit Taxes. In addition to taxes and royalties, a fiscal regime may include some form of excess profit tax, windfall tax or rent tax. These may differ substantially in form and impact. As described in the discussion of Principles of Mining Fiscal Regimes, a distinguishing feature of mining is the presence of *rents*. Theoretically, these rents—defined as the returns to mining in excess of all costs including the required return on investment—may be fully taxed without having an impact on investment. As a practical matter, this is nearly impossible to achieve given uncertainty in the measurement of rent, thus most such taxes aim to capture only some share of rent, however it is measured. A common tax in the petroleum sector, which is also used for mining in a few countries, is the Resource Rent Tax (RRT). An RRT measures annual cash flow to a project⁶ and taxes those cash flows once a hurdle rate of return is achieved. This requires slightly different accounting than is used for purposes of an income tax (e.g., interest expense is generally disallowed, and capital expenses are counted in the year incurred rather than amortized), but the principles are comparable. Some countries have opted instead to capture rents through variable rate royalties or progressive income tax rates.

Withholding Taxes. Withholding tax is not a separate category of tax, but rather a means of collecting tax on income. A mining company making payments to subcontractors may be obliged to withhold tax on these payments and then to remit these withholdings to the state revenue authorities. Where such payments are made to locally registered companies, they are generally creditable against that company’s income tax obligations. Where they are made to foreign companies, they may be treated as final taxes in satisfaction of any income tax the foreign subcontractor might otherwise owe. Withholding taxes are a means of combating tax avoidance (by collecting tax at the point of payment and placing obligations on companies with a tax presence in the country, opportunities for the recipient of the payment to avoid the tax are minimized). Similarly, payments of interest and dividends may be subject to withholding, though tax treaties often reduce or eliminate withholding on these payments. Thus, it is important to look beyond the statutory withholding rates when assessing the impact of these taxes on likely investors.

State Equity in Mining Operations. While virtually all states are already owners of their subsoil resources, some states choose to become partial owners of mining operations in their countries as well. State equity or state participation can take various forms. States may participate on a fully paid basis (contributing to development costs alongside the investor), they may take a carried interest (“paying for” development by forgoing certain revenues until they are paid-up), or they may take so-called “free equity” (participating in equity returns without taking on any financial burden). Reasons for taking state equity may be political as much as economic, though it is worth noting that the financial returns of state equity may be achieved through other fiscal tools, and the risks of some forms of equity may be significant.

⁶ Rent taxes should be applied on a ring-fenced basis.

Value Added Taxes (VAT). Value-added taxes are taxes on final domestic consumption. Since most mining production is exported for foreign consumption, mining companies should generally have any VAT paid on their inputs refunded to them upon sale of production. But because mining operations are capital intensive and may have long lead-times before production commences, applying VAT in the normal manner will often result in mining companies being in an excess credit position for long periods of time, meaning that tax authorities will be forced to pay refunds on a monthly basis, sometimes for years. Because of the challenges and inefficiencies of this system, some countries offer special arrangements to mining companies (e.g., zero-rating imports for mining operations). These special arrangements can, however, create complications and risks that must be carefully monitored.

Customs Duties. Customs duties may be used for both revenue purposes and for purposes of protecting domestic industry. In many mining jurisdictions, customs duties are seen as the earliest source of revenue from mining operations (apart from signing bonuses) and are thus emphasized heavily in the fiscal regime. The risk of this is that increasing development costs can significantly discourage investment, particularly in otherwise high-cost projects.

Other charges. Other types of payments may feature in mining fiscal regimes. Payments into agricultural or community development funds can be significant in some countries and may be calculated as fixed fees or as a percentage of mineral value or income. Surface rental fees and annual mining license fees may be used as both revenue raisers and as policy instruments to discourage the “hoarding” of land by mining companies. Signing bonuses are more common in petroleum, but have also featured in several mining regimes. These may be more appropriate where knowledge of the resource is sufficient to support an auction for the mineral rights. In addition, while employment taxes are not taxes on mining operations, they can be a significant source of revenue, particularly in the development phase of projects where the number of both high-wage foreign jobs and unskilled jobs are highest.

Stabilization. Stabilization is an important concept that comes up quite often in the extractive sector. Stabilization is the “freezing” of some or all of the fiscal regime so that changes to the law that come into effect after a license is issued or a contract is signed do not apply to those companies benefitting from stabilization. The rationale given is generally that investors need to have a high degree of certainty in the fiscal regime so that they can model the project returns with some confidence and assure themselves that project returns are adequate to justify investment. Stabilization of the law is not generally offered in developed countries, but in countries where investment risk is perceived to be higher, stabilization is not uncommon. The most far-reaching types of stabilization “freeze” all law (not just the fiscal regime). Thus, environmental law and regulations or health and safety regulations may be frozen with respect to a particular project, or the state may be required to compensate a company for the added cost related to any changes to these rules. More narrow stabilization might be limited to only a few key fiscal terms.

An important feature of stabilization regimes is whether they offer true stabilization or “one-way” stabilization. With one-way stabilization, a company may be protected from tax increases while being allowed to benefit from any tax reductions. The application of such a rule may be especially problematic where a county decides, for instance, to raise the royalty

and reduce the tax by an offsetting amount (or vice-versa). In such a case, a policy that was intended to be relatively neutral could in fact see a company benefit from the reduced tax while being protected from the royalty rise. Related to the concept of stabilization is the concept of the so-called “most-favored-company”. Most-favored-company provisions may require a government to give the company the benefit of any incentive or tax reduction offered to any other similarly situated company. This can significantly constrain policy choices.

III. The Mining Sector in Armenia

Armenia has diverse mineral resources, including iron, copper, molybdenum, lead, zinc, gold, silver, antimony, aluminum, as well as industrial mineral and products.⁷ Mining of metallic ores accounts for well over 90% of the value of total mineral production. Armenia ranks 7th globally in production of molybdenum, and 9th in estimated reserves (based on 2014 data). Armenia produced 41,220 tons of copper concentrate in 2012, placing it 10th of the 15 copper producers in Europe and Central Asia. Armenia ranks 9th of 16 producers of gold in the region.⁸

Mining and metallurgy are key components of Armenia’s economy. Mining is the largest export-generating sector, accounting for over half of exports in recent years⁹ and roughly 17% of industrial activity.¹⁰ 2015 has shown solid growth in the mining sector, in part due to the 2014 launch of the Teghut copper-molybdenum mine, the country’s second largest. Additional indicators of the role of mining in Armenia’s economy are included in Annex 1.

In part in response to concerns over weak tax revenues from the mining sector, Armenia adopted a new mining code and a package of accompanying legislation in 2011. A key part of this revision replaced the system of fees paid for the use of mineral resources with a variable royalty for metallic minerals. Government expectations were that the new code would yield substantial additional tax revenues. The new mining code attracted criticism from a number of environmental groups and NGOs, however, concerned that it weakened avenues for citizen input into decision-making around mining investment decisions and weakened important environmental provisions.¹¹

⁷ Ministry of Energy and Natural Resources (<http://www.minenergy.am/en/page/472>); U.S. Geological Survey (2014)

⁸ U.S. Geological Survey data (various publications).

⁹ Figures include base metals manufacturing. Mining products alone account for roughly 30% of exports. See Ministry of Energy and Natural Resources (<http://www.minenergy.am/en/page/472>); World Bank (2011); National Statistical Survey; UNDP (2014).

¹⁰ UNDP (2014)

¹¹ An assessment of such concerns is beyond the scope of this report.

IV. Armenia's Mining Fiscal Regime Royalties

Companies in Armenia that mine metals or produce ore concentrate¹² are required to pay a royalty on the proceeds of metal concentrate, smelting products, or final products sold.¹³

For sales of concentrate, the royalty base is the product of the price specified in the sales contract and the physical volume determined in accordance with the purchase agreement. The royalty is payable on a quarterly basis based on the amount payable under the purchase agreement at the time the product is provided. As purchase agreements typically include provisions for adjustment of sales proceeds upon final estimation of metal content, adjustments to the royalty shall be taken into account during the quarter during which such final estimation is complete. For purposes of such final calculations, price deductions for moisture or physical impurities shall not be taken into account, and final volumes can be no more than two percent less than initial reported volumes. Prices on which royalties are based may not differ by more than 10% from international prices based on LME data.

For sales of smelter product, the royalty base is the product of the physical volume of concentrate used in production and the average price of concentrate as published by Armenian Finance Officials (based on LME data).¹⁴ Volumes are based on the measured tons of smelter product multiplied by the physical volume of concentrate supplied for smelting used for production of one ton of smelter product as verified through technologically accepted means. A similar calculation is used for calculation of royalty on sales of final product.

The royalty rate to be applied against the bases described above is based on the profitability, calculated according to the following formula:

$$R = 4 + [P/(I \times 8)] \times 100$$

Where:

R = royalty rate (%)

P = EBIT, in AMD (taxable profit before interest and tax, excluding tax losses carried forward from previous years)¹⁵

I = Gross revenue from sales, in AMD (excluding VAT)

¹² "Royalty payers" are defined as companies or individuals that mine metals or produce ore concentrate (see Law on Natural Resource Use and Environmental Protection Fees, Art. 13.3).

¹³ Extraction of non-metallic minerals is subject to a different fee.

¹⁴ The Government Decree approving the procedure for computation of the royalty states that: "The measurement of the concentrate that is supplied for smelting in the reporting period is considered the actual volume of concentrate used that has been validated through technologically accepted means for the production of one ton of smelted ore." It is understood that the intent of this language is to assess the royalty on mineral content embodied in the concentrate, excluding mineral content lost in the smelting process.

¹⁵ "P" in the formula is defined as the "positive difference of the royalty calculation basis and the reductions defined by the RA Law on Profit Tax (except for financial activity costs and tax losses from previous years)". Thus, negative EBIT values are treated as nil for purposes of the formula, ensuring that the royalty cannot drop below 4%.

EBIT and gross revenues are measured solely with respect to mining income, though where a company holds multiple mining licenses EBIT and gross revenues are measured on a firm-wide (i.e., non-ring fenced) basis.

The royalty is deductible from income for purposes of the calculation of profits tax.¹⁶

Profits Tax

Mining companies are subject to taxation in accordance with the Profits Tax Law of 1997. The profits tax applies to mining companies as it would to any other company in Armenia, with no apparent special provisions for the mining sector.

Tax Rate

The profits tax rate is 20%, assessed on income calculated in accordance with the law on Profit Tax (Art. 33).

Accounting

Taxable profit must be accounted for using the accrual method (Art. 42).

Depreciation

Depreciation is required to be straight-line, and rates for mining are the same as those generally applicable under the Profits Tax law. Selected rates, set in Article 12, include:

Buildings and Constructions	20 years
Other fixed assets	5 years
Intangible assets	amortized over lesser of: period of useful economic life or 10 years
Exploration costs ¹⁷	amortized over lesser of: period of useful economic life or 10 years

Special depreciation rates apply to assets located in disaster areas (currently Gyumri). Mining companies do not benefit from accelerated depreciation under the law.

Utilization of Losses

All taxpayers in Armenia may carry unutilized losses forward for up to 5 years (Art. 25).

There are no ring-fencing requirements in Armenia, meaning that companies may deduct exploration and development expenditures from the income from any operating mines.

¹⁶ It is interesting to note that several frequently cited descriptions of the Armenian royalty formula are erroneous. The Lydian International website describes the royalty thusly: “[The royalty] in Armenia it is a top and bottom line charge (or more accurately a charge on turnover and a charge on profits before interest costs (EBIT))” (see: <http://www.lydianinternational.co.uk/armenia-mining-tax.htm>). In fact, the royalty calculation uses EBIT to determine the rate, but the royalty itself is not a charge on EBIT.

¹⁷ Profits Tax Law, Art. 14

Thin-Capitalization

Interest expense on debt used to fund business activities is deductible, with the maximum allowable rate set by regulation. There is no thin capitalization rule.¹⁸

Head Office Expenses

There are no overarching limitations on the deductibility of head office expenses of Armenian companies with foreign parents, though deductions for certain expenses incurred outside of Armenia are limited to rates established by the government (Art. 16).¹⁹

Deductible Expenses

Tax practitioners in Armenia report that there is a lack of clarity around the deductibility of certain expenses for all taxpayers, including mining companies, and that deductions for many seemingly reasonable expenses are often disallowed. Greater clarity around definitions of deductible expenses is desirable.

Related Party Transactions

There are no specific rules in Armenia relating to transactions between related parties, though Armenia has entered into a number of double taxation treaties that include articles resembling Article 9 of the OECD Model Taxation Convention.²⁰

Rehabilitation

Mining companies are required to make payments into a “nature and environment preservation fund” (Mining Code, Art. 69) established to fund environmental works, including reclamation, indicated in the mining technical plan and to cover any damages from mining activity not remedied by the company. Disbursements are made to the mining company from the fund to cover necessary expenditures, with any balance reimbursed to the mining operator. For tax purposes, contributions to the fund are assumed to be deductible, though the law is not clear on this. Presumably, any eventual reimbursement should also be included in income, though again the law is unclear. The tax treatment of any internal build-up in the fund is not specified.

Special Incentives

Stabilization. Article 25 of the Mining Code provides for a three-year stabilization period following the grant of a mining right, during which a company shall be subject to the rates for natural resource user fee, royalty, profit tax, and withholding on dividends and interest that were in effect upon the grant of the mining right, notwithstanding any legislative changes during the stabilization period. Armenia has apparently offered tax stabilization covering not only the rates, but all aspects of income tax calculation, in certain contracts, with reports

¹⁸ See PWC (2011)

¹⁹ Deductions are limited on expenditure for, inter alia, “representative expenses”, advertising and marketing expenses, training, and business trips.

²⁰ See EY (2014) Worldwide Transfer Pricing Reference Guide 2014. Article 9 of the OECD Model Convention provides that, in the case of a transaction between related parties in which “conditions are made or imposed between the two enterprises in their commercial or financial relations which differ from those which would be made between independent enterprises, then any profits which would, but for those conditions, have accrued to one of the enterprises, but, by reason of those conditions, have not so accrued, may be included in the profits of that enterprise and taxed accordingly.”

suggesting that terms may be 10 to 12 years.²¹ Stabilization of the foreign investments law is offered for a period of 5 years.

Withholding

Dividends and interest paid to non-residents is subject to withholding at the source at the following rates:

Interest 10%

Dividends 10%

Withholding rates are reduced by treaty to 5%, or in some cases 0%, where the payee is located in any of several countries with which Armenia has entered into tax treaties.²²

Windfall/Rent Taxes

There is no separate windfall or rent tax in Armenia, though as described above the royalty includes a profit-based element designed to increase the royalty rate as project profitability increases.

Value Added Tax (VAT)

A 20% VAT is generally payable by all taxpayers exceeding specified sales thresholds. Armenia uses the credit method for calculating VAT, such that VAT paid to suppliers is creditable against VAT collected from customers.

Imported goods included in an approved list that are afforded the benefit of a 0% customs duty and which are not subject to excise tax are not subject to VAT.²³

Exported goods, including mining products, are zero-rated under Armenia's VAT, and certain other items (including sales of precious and semiprecious stones) are exempted from VAT.²⁴ Mining products for the domestic market are subject to VAT at the standard rate. Input VAT in excess of the output tax is generally applied against VAT payable in future reporting periods, though refunds of input VAT (to be paid within 90 days) are permitted for purchases and importations directly related to zero-rated transactions.²⁵

²¹ The World Bank describes a 10-year stabilization period (see World Bank (2011)), while other reports suggest that 12-year stabilization contracts have been signed (see, e.g., "Armenia: Mining Journal Special Publication", available at: <http://www.infomine.com/publications/docs/MiningJournalNov2005.pdf>). Authority for these longer stabilization periods appears to derive from the previous Law on Allocation for Subsoil Exploration and Commercial Production for the Purposes of Mineral Resources Development, which was repealed and replaced by the current Mining Code. Whether stabilization in excess of the three-year period provided by Article 25 of the Mining Code has been offered since passage of the new law is unclear.

²² See Vardanyan & Partners (2015)

²³ See Armenian Development Agency (2015)

²⁴ Note that "zero rating" and VAT "exemption" are two very different concepts that are sometimes misunderstood. When a product is "zero-rated", suppliers of that product may claim refunds for all VAT paid on inputs. In contrast, when a product is "exempt" from VAT, no VAT is collected on the sale of that product, but none of the VAT paid on inputs is refunded.

²⁵ See PWC (2011)

Customs Duties and Excise Taxes

Import duties are zero for mining equipment and supplies under the Customs Code.²⁶

Other Fees

In addition to the payments and fees described above, the Mining Code provides that mining is subject to the following additional fees: (1) an environmental fee for implementation of environmental protection measures; (2) a fee for monitoring of health and safety and waste disposal; and (3) a stamp duty for the provision of mine authorization (Art. 61). Rates for these fees are low, and they make up only a small percentage of government revenues from the mining sector.

A Natural Resource User Fee (NRUF) applies on non-metallic minerals.

Other Relevant Provisions

Mining rights may be held by domestic or foreign entities (Mining Code, Art. 20) and may be transferred subject to regulatory approval (Mining Code, Art. 23).

Mining rights are provided with a period not exceeding 50 years (3 years for exploration rights) subject to extension (Mining Code, Arts. 27 & 55).

Mining rights may be terminated for, inter alia, the failure to meet conditions of the mining right or to pay fees owed (Mining Code, Art. 30).

Successful applicants for mining rights enter into mining agreements with the state (Mining Code, Art. 54), which provide for, inter alia, the types of minerals permitted to be extracted, duration, environmental management plan and other provisions. For purposes of the fiscal regime, it is also noted that mining agreements are to provide details regarding the “calculation and payment” of fees for use of minerals and the environmental protection fund, as well as provisions regarding responsibilities related to the socio-economic development of the community. Mining agreements may not contradict legislation (Art. 54(4)(12)).

V. Analysis of the Fiscal Regime

The mining fiscal regime for metals²⁷ in Armenia consists of two main elements:

1. An ad valorem royalty (the royalty itself can be considered as two separate elements: a fixed royalty of 4% and a variable royalty); and
2. The generally applicable corporate tax (including withholding taxes on remittances to nonresidents);

This general structure is reasonable, but there are aspects of each element that could be improved to better meet Armenia’s objectives. This Part V provides a brief discussion of the performance of the fiscal regime, followed by a detailed analysis of various components of that regime.

²⁶ See also: Foreign Investments Law (Art. 15)

²⁷ The analysis focuses on the fiscal regime for the mining of metallic substances.

Policy Assessment

General. With the exception of import duty exemptions offered to mining companies, Armenia generally applies the customs and income tax rules and regulations to the mining sector in the same manner as they are applied to other industries. It is also understood that individual contract-based fiscal arrangements are not common in Armenia, meaning that mining companies are generally taxed in a relatively uniform manner. Each of these characteristics reflects best practice and should facilitate effective administration and reduce tax-based distortions in the economy.

Royalties. While a typical advantage of royalties is that they are relatively easier to administer than income taxes and other profit-based instruments, variable royalties that are based on a measurement of profits elements can be more difficult to administer and can expose royalty revenues to risks of transfer pricing and other tax avoidance strategies. These risks are higher where the minimum royalty under the variable formula is particularly low (see, e.g., South Africa, with a 0.5% minimum royalty). In contrast, Armenia's royalty has a relatively high "floor", which avoids the risk present in some variable royalty systems of extraction being effectively uncompensated. That being said, there are aspects of the royalty that could be improved.

Armenia should consider ring-fencing individual mining projects for purposes of the royalty calculation. Ring fencing is generally a feature of certain fiscal tools such as resource rent taxes, because rents are project specific. While Armenia does not have a resource rent tax, its profits-based variable royalty is based on a measure of profit. This profit should be measured on a ring-fenced basis for the royalty to function properly. Profit-linked royalties are generally intended to compensate the state (as the resource owner) to a greater extent for high quality, low cost mines relative to lower quality, high cost mines, other things being equal. Because the non-ring-fenced royalty calculates royalty rates on the basis of profitability measurements averaged over multiple mines, royalties on low profit mines may be higher than desired and royalties on high profit mines may be lower than desired. This may well distort decisions, reduce revenues and complicate administration.

Armenia's royalty for metal concentrates is based on contract prices²⁸, but Article 18 of the Law on Natural Resource Use and Environmental Protection Fees prohibits contract prices from differing by more than 10% relative to LME prices for purposes of the royalty calculation. This safeguard linked to reference prices functions as an anti-abuse rule providing the government with some protection against transfer mispricing. There may, however, be advantages to using the LME price as the basis for the royalty in the first instance, rather than simply using LME prices as the basis for this minimum price safeguard. Using published index prices, rather than contract prices, to calculate the royalty base would simplify administration of the royalty by eliminating the need to monitor and evaluate contract prices. While royalties in many countries continue to be based on some measure of received prices, an increasing number of countries are using the "index-price" approach. This valuation methodology may be preferable to basing royalties on received prices (which leaves the government more

²⁸ The royalty base for smelter product is calculated using published prices based on LME data.

susceptible to transfer pricing abuses) or valuation methods that allow for deduction of various costs of production, which complicate administration and increase the risk of manipulation to reduce royalty obligations.²⁹

Moreover, companies selling to related parties face incentives to lower contract prices down to the floor set by the LME price-linked safeguard, which in some circumstances may be lower than the arms-length price. In the absence of robust administration of the royalty, there is a risk that the current system may tend to result de facto use of the safeguard price, in which case the use of the contract price in the first instance would add complexity while offering only a marginal expected benefit over a simplified system relying solely on LME prices.³⁰

Another important consideration with respect to the royalty is the point at which minerals are valued for purposes of the royalty calculation. Armenia's royalty is assessed on the metal content of the product sold, meaning that royalty is not paid with respect to mineral content lost in the transformation process. The fact that no royalty is assessed on production losses means that companies face weaker incentives to maximize the efficiency of processing than they would face if the royalty were assessed on all mineral content extracted. To promote efficiency, Armenia should consider imposing the royalty as far upstream as possible—at the first “measurable point”—rather than imposing the royalty on sales. In addition to promoting more efficient resource use³¹, this approach has other advantages, including: (1) reducing variations in effective royalty rates across producers based on their point of sale; (2) eliminating the need for integrated operations to measure concentrate input into their own smelters; and (3) reducing transfer pricing risks.

²⁹ Some refinement to the index price methodology may be desirable. In its 2011 study of Armenia's mining tax regime, the World Bank noted that the use of reference prices for the previous royalty resulted in lower revenues than actual prices would have, due to the fact that copper prices in Armenia were consistently higher than the international price (likely due to the poly-metallic nature of most mines in Armenia). This issue requires further study of Armenia's experience since the implementation of the new royalty.

³⁰ Using LME prices rather than contract prices as the basis for the royalty could constitute an increase in the effective royalty rate. An offsetting reduction in the royalty rate might be used in such a case. For instance, a royalty set at 3.6% of the LME price would be equivalent to a royalty set at 4% of 90% of the LME price ($0.04 \times 0.90 = 0.036$). In this case, companies currently paying royalties based on the minimum price of 90% of LME prices would pay the same amount under the revised system. If it is assumed that most prices for royalty purposes are being set at or near the 90% floor (this may not be the case, as mentioned in footnote 29), then the change to the royalty formula could be revenue neutral for most miners, while any company currently using a contract price above the 90% floor would pay less. This is meant simply to illustrate how the royalty right might be adjusted to facilitate administration without leading to an increase in royalties for any metals miner. A smaller adjustment to the royalty rate could also be used, which could result in some companies paying higher royalties than they pay under the current system.

³¹ One of the criticisms levied by civil society and others against the shift from the Natural Resource Use Fee (NRUF) to the royalty is that the NRUF was assessed on mineral use, whereas the royalty is assessed on product sales. As suggested in the text, an ad valorem royalty need not be calculated at the first point of sale, and can instead be calculated at the first point of measurement using a deemed price based on a published index. Thus, an ad valorem royalty can create efficiency incentives akin to those created by the NRUF (which is similar to a unit based royalty), while also maintaining the advantages of an ad valorem approach, such as greater responsiveness to mineral prices.

Annex 2 (and various studies of mining fiscal regimes) indicates that royalty rates generally fall within a range of 0% to 9%³². Even for projects with relatively low rates of return, Armenia's variable royalty is likely to rise to the top of this range or exceed it. For instance, a project with a modest pre-tax rate of return of 18% could face an average royalty over the life of mine of 9%, with more profitable projects facing higher average royalty rates. The impact of these relatively high royalty rates on project economics may create very strong incentives for companies to understate revenue and profit measurements in order to reduce the variable component of the royalty rate. Such incentives are always present where any profit-based element (such as the profits tax) features in the fiscal regime, but the reliance of the royalty on profit-based measures compounds the incentive facing companies and raises the stakes on the ability of Armenian authorities to effectively monitor and enforce compliance with income calculation rules.

Despite the fact that the royalty formula provided in law should theoretically result in a relatively high royalty rate for most companies, several officials and observers interviewed have expressed a belief that metals mining companies tend to pay royalty rates closer to 4-5%. This has not been verified with the appropriate authorities, but the assumption by company advisors that the royalty rate tends to be close to 4% is some cause for concern as it suggests that the formula may be applied in a different manner than intended or may be reduced through manipulation of income measurement. Further study is necessary to better understand how the royalty has been applied in practice. If it turns out that there is in fact a significant difference between the expected royalty rates and the royalty rates actually paid, this would suggest that the variable royalty mechanism is ineffective and that there is an urgent need to improve royalty administration. It might also suggest consideration of different approaches to the variable royalty mechanism.³³

Additional discussion of the royalty rate and structure is included in the economic assessment and modeling discussion at the end of this Part.

Another issue that should be addressed relates to the legal framework establishing the royalty. Rules relevant to the calculation of the royalty are currently found in multiple legal instruments: Article 61(2)(5) of the Mining Code provides that a royalty is owed on mining of metallic minerals; The Law on Environmental Exploitation Fees provides the royalty rate formula; Government Decision N-1901 provides the rules for calculating sales proceeds for purposes of the royalty; and Article 18(2) of the Law on Natural Resource Use and Environmental Protection Fees provides for the floor set at 90% of LME prices. The proper interaction of these various instruments under Armenian law is understood to be currently at the heart of multiple legal disputes between mining companies and the state. Streamlining

³² It may be noted that some of the royalties in Annex 2 list rates higher than 9%. In most cases, these are marginal rates that only apply to a portion of production or value. The average effective rate in these countries will generally fall within the 0-9% range.

³³ For instance, the variable royalty could be tied to changes in index prices for the underlying minerals. Such an approach is more common for petroleum fiscal regimes, but may be used for minerals with observable market prices as well. For instance, Queensland applies a variable royalty on base and precious metals that rises as prevailing market prices pass specified thresholds. Application of such an approach to poly-metallic mines may face added complexities.

the legal basis for the royalty would not only make the regime clearer to potential investors and other stakeholders, it would also simplify administration and reduce the risk of such disputes.

Profits tax. While the lack of special incentives and mining specific rules noted above is positive, Armenia's income tax rate is low by international standards. The average in the sample described in Annex 2 is 27%, which is consistent with other comparative studies of mining tax regimes.

There are numerous features of the income tax structure that bear mention:

- **Transfer pricing rules.** Armenia lacks transfer-pricing rules, which leaves it vulnerable to tax leakage. This is likely an issue not only from the mining sector, but for other sectors of the economy as well. Transfer pricing refers to the setting of prices for goods and services supplied between affiliates. Because the pricing in these transactions is "controlled", multinationals have the ability to shift taxes to low tax jurisdictions through their pricing absent effective controls.
- **Ring-fencing.** In general, whether or not to ring-fence for profits tax purposes is a policy choice with both pros and cons. Ring-fencing prevents companies from reducing or deferring income taxes on a profitable mine by deducting exploration or development costs from another project early stage (or loss-making) project. Countries might choose not to ring-fence, however, in order to create an incentive for further exploration.³⁴ Ring-fencing for purposes of the variable royalty was previously discussed, and while it is possible to ring fence for the royalty but not the income tax (or vice versa) there may be efficiency gains in administering both charges on the same ring-fenced (or non-ring-fenced) basis.
- **Thin capitalization.** The lack of a thin capitalization rule in Armenia risks potentially significant revenue losses, especially when coupled with what is reported to be a rather high allowable interest rate.³⁵ High allowable rates and a lack of thin capitalization rules create incentives for companies to structure their capital investments as related-party debt (rather than equity) and to charge high rates in order to minimize taxes. Such structures may also enable companies to repatriate profits at lower effective rates of tax if withholding rates are low (or if reduced withholding is available under tax treaties).
- **Head Office Expenses.** Excessive management fees charged to overseas parent companies may be used as a way to shift taxable income away from Armenia to offshore or low tax jurisdictions. Charges for management services should fall within transfer pricing regimes (where they exist), but because of they may be especially difficult to police, some countries opt to apply special limits on the amount of management fees that can be deducted. Armenia has no such limitations. Introducing a cap (e.g., some fixed percentage of costs) may help to reduce revenue leakage.

³⁴ It is important to note that such an incentive would apply unevenly, with new entrants unable to benefit from the tax deferral afforded to companies with already-profitable projects in operation.

³⁵ The World Bank, in its assessment of Armenia's mining fiscal regime, suggests that the interest rates allowed in Armenia are "very high". See World Bank (2011). Author was unable to verify the allowable rate currently in effect.

- **Loss carry-forward.** Depending on what other changes are made to the mining fiscal regime, Armenia could consider relaxing its restriction on loss carry-forwards. The current 5-year limitation is at the low end of international practice, and there is arguably no basis for denying deductions for properly incurred costs. Limitations are more about the administrative burden of tracking large carry-forward accounts over time, but for a capital intensive sector with long project lead times and long mining phases, increasing revenues by allowing significant losses to expire may be inappropriate. A 7-year, 10-year, or even indefinite carry-forward period may be preferable, or a limitation of the type used in Liberia, which allows indefinite carry-forward but caps the total amount that may be used in any one year as a percentage of taxable income.
- **Double taxation agreements.** Armenia's withholding taxes are set at a reasonable level, but it has entered into several double taxation agreements that reduce withholding rates. This enables companies to structure their Armenian holdings in a manner of take advantage of the reduced rates. Withholding tax reductions via tax treaty are a significant problem for many mineral rich countries that have substantial investment inflows into the mining sector but relatively small investment outflows.
- **Rehabilitation.** Mining companies are appropriately required to make payments into a nature and environmental preservation fund, intended to cover reclamation expenses as well as unspecified damages. It has been suggested that contributions to these funds are generally treated by both companies and authorities as tax deductible. Specific rules should be promulgated to make this clear, as well as to clarify the tax treatment of any excess amounts returned to the company (they should be taxable if there was a deduction for contributions) as well as any interest built up in such funds.

Environmental Fees. The level and structure of environmental use fees in Armenia has been the subject of some discussion within Armenia. It is noted in this report that the current environmental fee for the implementation of environmental protection measures is not a significant revenue raiser. It is, of course, important that environmental damage and resource use be compensated, whether that use or damage is necessary and anticipated in the mining plan, or extraordinary (e.g., resulting from an accident). It is also the case that well structured fees may be viewed not as revenue generators, but rather be designed to incentivize or discourage certain environmental practices. For instance, it is understood that a recent draft law would assess fees based on the amount of overburden or wet tailings produced, but that mining companies would be exempted from such laws for five years.

It is also important to note, of course, that financial charges are not the only tool at a government's disposal for regulating environmental performance of the mining sector. Robust environmental regulations and enforcement are likely to be more important than small charges on tailings or overburden removal. In this regard, clear criteria and standards for environmental impact assessments are important, as well as provisions to insure that the balances in reclamation funds are, at all points in time, adequate to cover projected

reclamation expenses.³⁶ These amounts should be updated periodically, particularly for changes to the mine plan.

It is beyond the scope of this paper to determine whether the proposed environmental taxes are likely to accomplish their policy objectives. From a revenue perspective, one could argue that such taxes should not be viewed as significant sources of revenue. If a lack of funding for environmental management is the primary consideration, a budget line for such costs may be preferable to limiting payment to earmarked charges, though there may be compelling political or context-specific reasons for using the latter approach.

Stabilization. Armenia offers tax stabilization of key fiscal rates for three years. Stabilization restricts the ability of the government to make necessary or desired reforms and can result in a patchwork of tax regimes across the sector, which can complicate administration. The short three-year stabilization period provided by the mining code, and the fact that stabilization appears to apply only to the major fiscal rates, should mitigate the negative impacts of stabilization and suggest a prudent approach to this issue in Armenia. It is unclear whether broader or longer-term stabilization is offered by contract. If so, further analysis would be required to understand the impact of stabilization policies.

International Comparison and Benchmarking

Annex 2 provides a description of international fiscal regimes chosen for comparison. The set of countries included in the comparison includes countries with similar resource bases and production statistics as Armenia, as well as countries with vastly more significant production. The set includes some that are geographically proximate to Armenia, as well as representative countries from a number of regions around the world. In some cases, otherwise ideal comparators were excluded on the basis of a lack of information (or a lack of translated information).

As noted previously, Armenia's royalty, even for relatively low profitability mines, is likely to be at the top of the range of royalties applied internationally, while its income tax is low by international standards. Benchmarking individual fiscal terms in this manner, however, does not provide a meaningful basis on which to assess fiscal regimes. Differences in terminology can easily result in non-comparable fiscal tools being compared with each other. More significantly, what matters more than the individual elements of the fiscal regime is how it operates as a whole.

Accordingly, the following section provides an economic analysis of Armenia's fiscal regime as a whole against the set of comparators.

³⁶ The current payment schedule requires companies to pay 15% of projected rehabilitation fees up front, with the remainder paid in equal installments over the life of the project. There is a risk with such a system that funds will not be adequate to cover rehabilitation and closure in all cases, since closure liabilities do not necessarily increase in linear fashion and closure may occur earlier than expected for a variety of reasons. Thus, Armenia should consider requiring other forms of financial assurance to cover any gaps between anticipated rehabilitation costs and the balance of the nature and environmental preservation funds at any point in time, such as closure bonds, warranties, securities or insurance.

Economic Assessment

The economic assessment and international comparisons are based on the financial model of a copper, gold and molybdenum mine similar in size to poly-metallic mines found in Armenia. Parameters for the model mine are drawn from various sources, including published feasibility studies and the author's own data. Key parameters for the mine are described in Table 2.

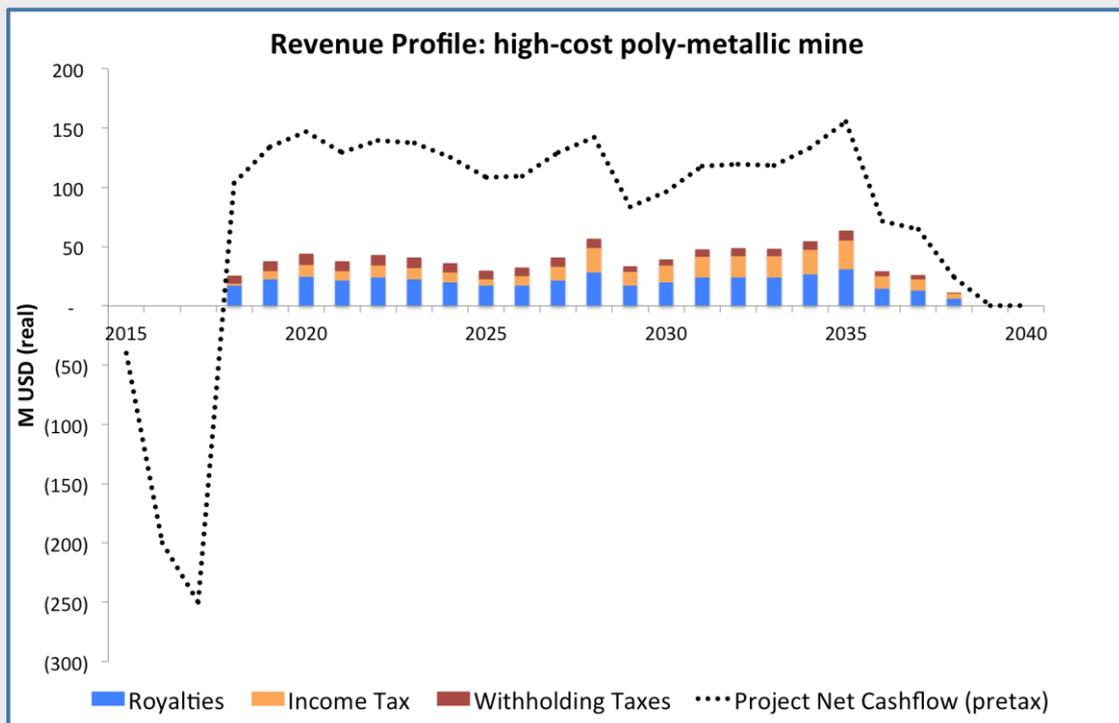
Table 2: Mine model parameters³⁷

Copper produced:	599,000 t
Gold produced:	19.9M g
Molybdenum produced:	5000 t
Development costs:	450M USD
Operating expenses:	3168 USD/t of copper concentrate
Rehabilitation costs:	6M USD
Production period:	21 years
Pre-tax IRR of the project:	22.2%
Debt:	Unless otherwise indicated, 75% debt funding of development is assumed
Long-term copper price	5750 USD/t FOB
Long-term gold price	45 USD/g FOB

³⁷ The model assumes full application of statutory rates in each country. In many countries, including Armenia, withholding rates may be lower in practice than the statutory rates due to the effect of tax treaties, thus actual rates of withholding may differ from those reflected in the model. The model disregards minor fees and employment taxes.

The revenue and tax payment profile of the modeled project under Armenian law are described in Figure 1.³⁸ It is apparent from Figure 1 that royalties in Armenia represent the bulk of expected government revenues from metals mining,³⁹ and indeed royalties account for roughly 65% of total net present value (NPV)⁴⁰ of government revenues from the modeled project. This is unsurprising given the fact that Armenia’s royalty is relatively high by international standards. Its deductibility for tax purposes also reduces the total income tax due. By comparison, a low royalty/high tax jurisdiction like Brazil, which is comparable to Armenia in terms of overall fiscal burden, would see just 15% of the expected NPV attributable to the royalty.

FIGURE 1



The emphasis on the royalty ensures that Armenia will capture a sizeable share of early project revenues compared to income taxes, which are usually delayed due to the write-off of large up-front costs. In general, if royalties are too high they can make a fiscal regime overly

³⁸ In this figure, the Project Net Cashflow (pretax) line indicates the net cash flow over the life of the project. The large negative values in the early years of the project reflect the fact that mining projects require large capital investments to be made during the development phase, before mining commences. Positive cash flows commence once production begins and minerals are sold. The uneven cash flows during the production phase reflect assumptions about the production profile, which is based on that of an actual mine. The capital expenditure profile in this model (to which all of the calculations in this study are highly sensitive) is also based on that of an actual mine.

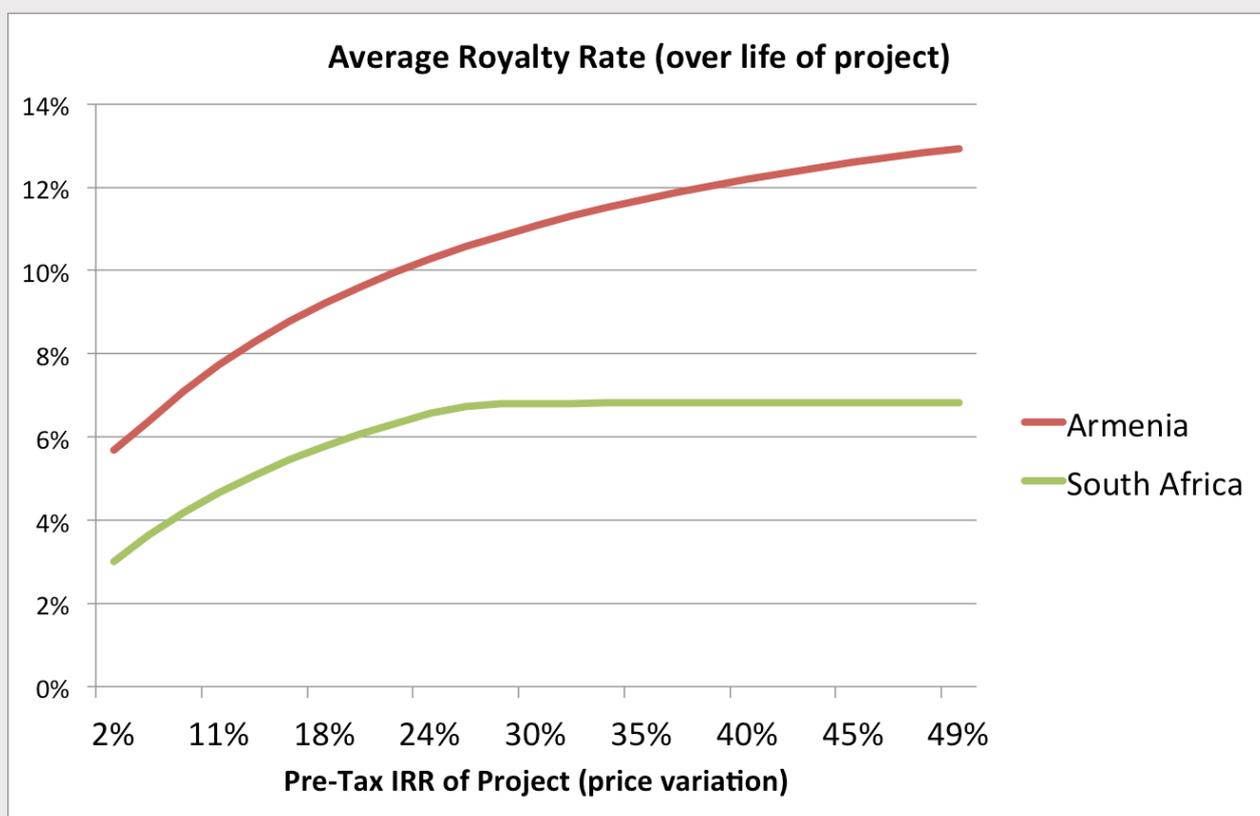
³⁹ The figure illustrates real revenues at constant prices. The uneven nature of the revenue profile is based on an actual mine on which this model was based and reflects a typical uneven production profile and cost structure.

⁴⁰ Net Present Value is calculated using the discounted cash flow method, whereby expected future cash flows are discounted using a risk adjusted discount rate (assumed in this case to be 8%).

regressive, and the possibility of having to pay large royalties even during loss making periods may discourage investors.

Armenia’s variable royalty includes a profit-sensitive component that should mitigate this effect. This profit-based element ensures that unprofitable mines do not pay the highest rates of royalty, while the fixed component ensures that the government is compensated at least to some extent for all minerals extracted. Looking more closely at the royalty structure, it is important to note that a relatively high royalty may be reached rather quickly, even for low-profit mines. Figure 2 compares the average royalty rate over the life of a project for a mine in Armenia versus one in South Africa—which uses a profit-base royalty that resembles Armenia’s in structure—in relation to the pre-tax rate of return of the project (varying prices to change the IRR). It is apparent first of all that South Africa’s royalty has both a lower floor and a lower ceiling. In fact, there is no ceiling on Armenia’s royalty and it can theoretically

FIGURE 2



keep rising with profits.⁴¹

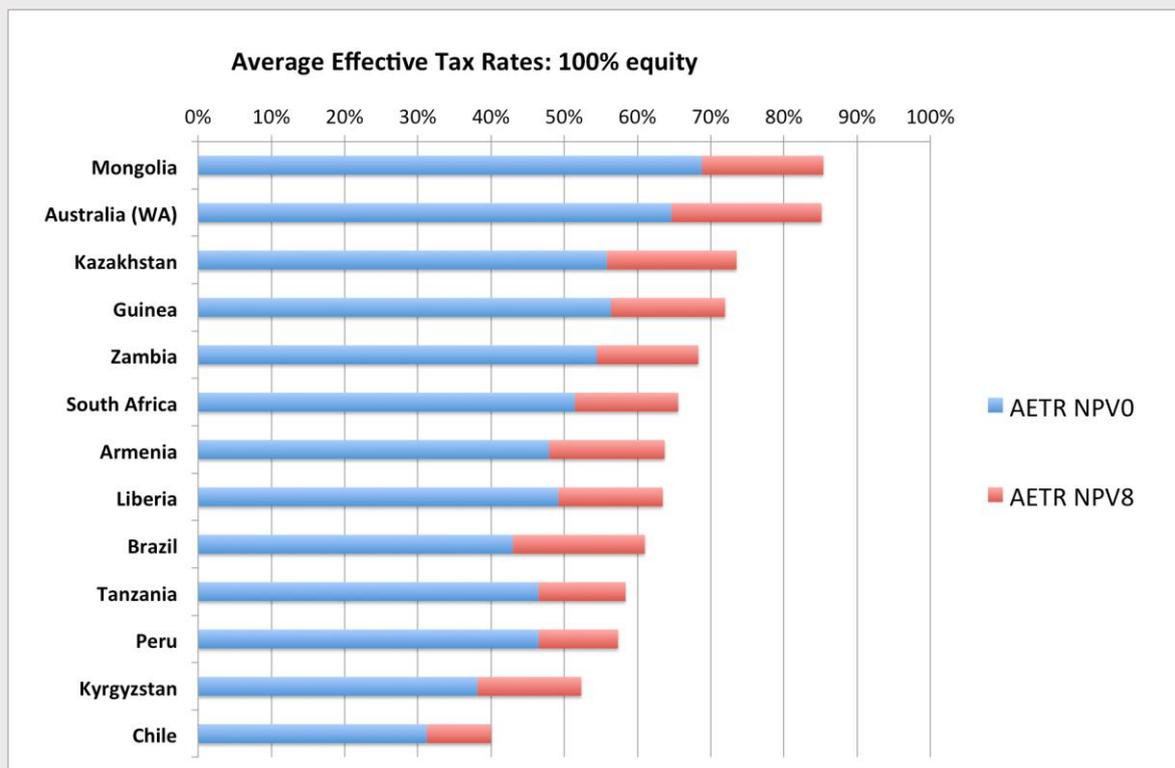
Despite the fact that Armenia’s royalty appears to be more responsive to profitability than South Africa’s, the latter’s overall fiscal regime is in fact slightly more progressive than

⁴¹ Note that Figure 2 illustrates the theoretical expected royalty rate for projects of varying levels of profitability. As noted elsewhere in this report, actual royalty rates paid by taxpayers in Armenia may be lower than these modeled rates for a variety of reasons, including transfer mispricing and other methods to decrease income calculations. Further, the chart isolates the royalty rate and should not be taken as an indication of the relative total fiscal burdens in South Africa and Armenia, which depend on a number of other elements as discussed herein. Figures 3 to 7 offer comparisons of the fiscal regimes taken as a whole.

Armenia’s. This is due to the fact that it relies more heavily on income taxes, which are typically more progressive than even highly profit-sensitive flexible royalties, and only underscores the importance of looking at the fiscal regime as a whole, rather than focusing too heavily on individual elements.

A principal metric for evaluating the fiscal regime as a whole is the average effective tax rate (AETR). AETR measures the government’s share of pre-tax cash flows to the project and is thus an important measure of “government take”. Figure 3 provides a comparison of Armenia’s AETR against a selection of comparators. The graph provides two figures, AETR on an undiscounted basis (NPV0), and AETR on a discounted basis (NPV8). A government’s share of total project value is typically higher on a discounted basis. This is because the government takes a greater share of the net value in early years when it collects some revenue flows while the company is in a negative cash flow position due to the requirements of project development.

FIGURE 3

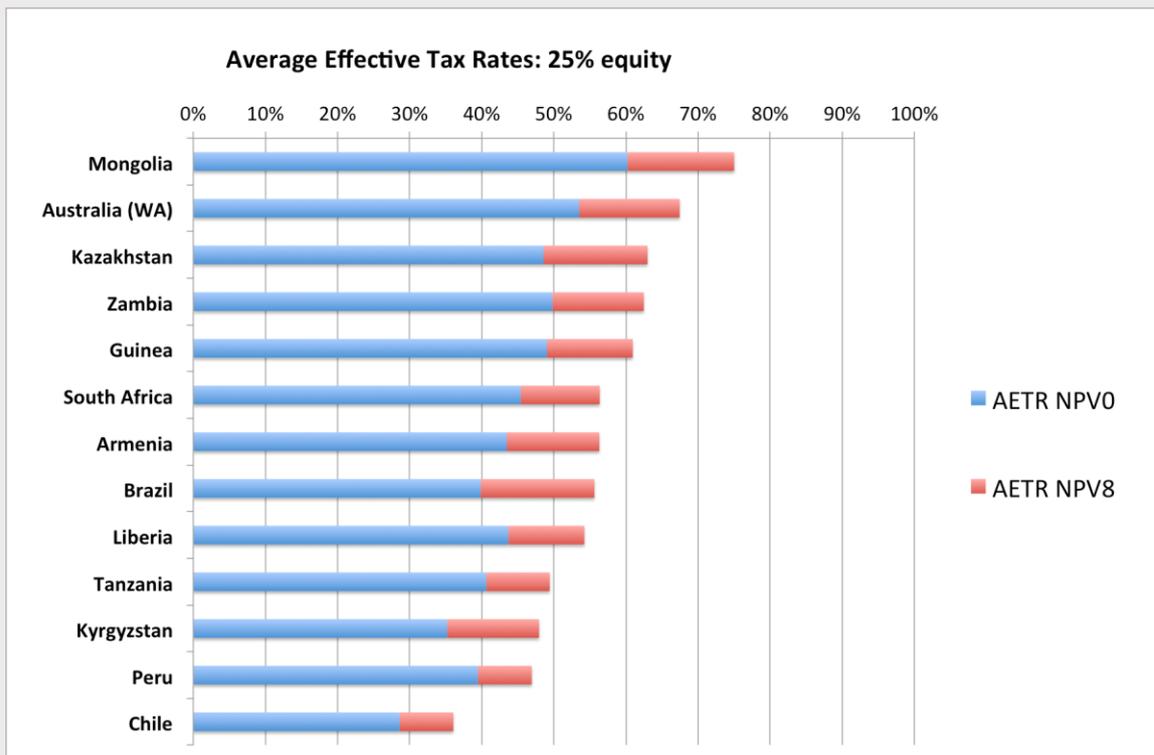


It is apparent from this table that Armenia’s share of the net present value of the project, at 64%, falls almost precisely in the middle of the range of countries sampled, where the average AETR was 65%. Raising the price (or lowering costs) used for the model allows measurement

of predicted AETR on both higher and lower profit mines. Armenia’s expected AETR is close to the average of the group for each scenario tested.⁴²

Figure 3 provides AETR on an assumption of 100% equity financing. Such an approach is commonly used as a means of evaluating fiscal regimes, but it greatly obscures the sensitivity of various fiscal regimes to debt. Figure 4 shows AETRs across the range of countries assuming that 75% of development is financed with debt, thus picking up the effect of thin capitalization, interest deductibility, interest withholding, and other important elements of the fiscal regime. Again, Armenia falls almost precisely at the middle of the pack, and this again holds for a variety of profitability scenarios.

FIGURE 4



As discussed previously, an important feature of a fiscal regime is its overall level of progressivity or regressivity. One metric commonly used to measure progressivity or regressivity is “state share of total benefits”. This measure is similar to AETR, but excludes initial investment, which can obscure the degree of progressivity/regressivity in the fiscal regime. “Total benefits” for purposes of this metric is thus calculated as revenues, minus operating costs and replacement capital expenditure after start up.⁴³ Figure 5 shows the state share of total benefits for the set of comparator countries. Again, Armenia falls close to the middle of the group. For a project with a pre-tax IRR of 30%, Armenia’s share of total benefits is 37.5%, versus an average for the group of 39%. The slope of the line indicates that the regime is moderately progressive, which should give increasing returns to the state during periods of rising profits in the mining sector. It is interesting to note the different profiles

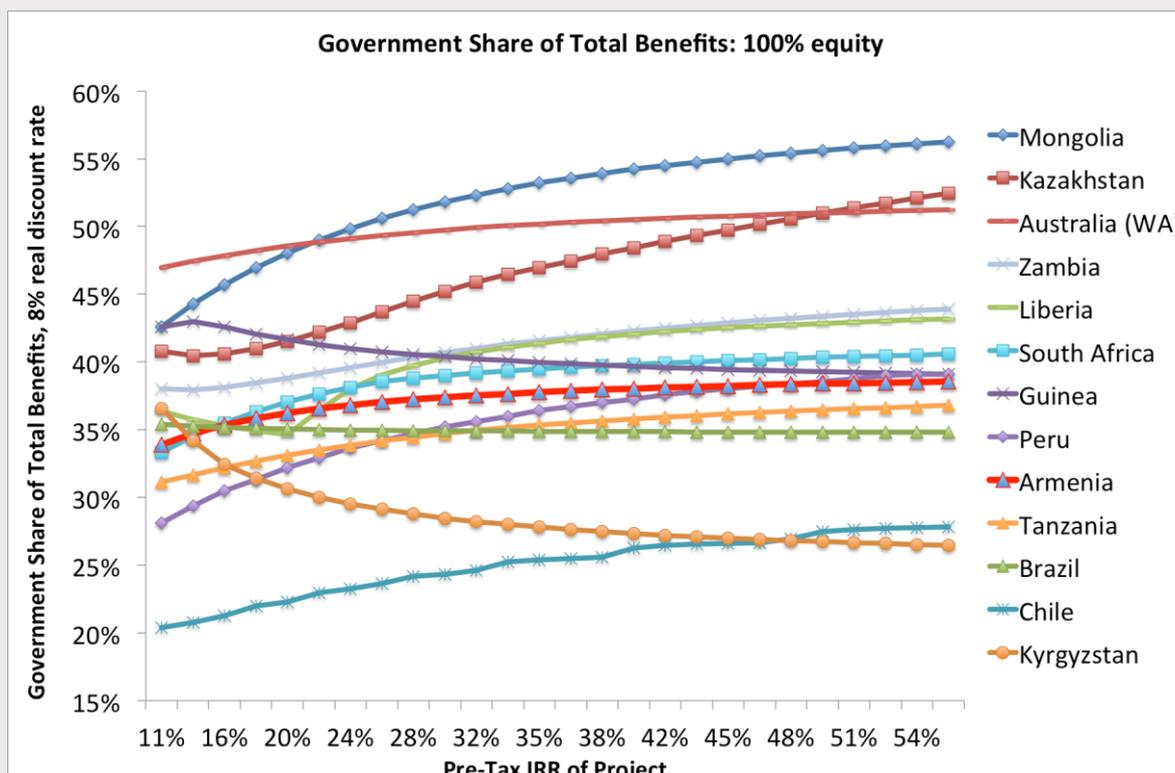
⁴² For the sake of simplicity, modeled results are not presented for each scenario tested.

⁴³ See Daniel, P. (2010)

reflected in Figure 5. Kyrgyzstan’s regressive profile is largely a function of its very low income tax rate, while Mongolia’s sharply progressive profile is a function of a large share of state equity⁴⁴. Liberia’s sharp uptick around 20% of pre-tax IRR is a function of a resource rent tax that is triggered near that level.

In addition to the overall tax take and overall share of benefits, it is also important to measure the marginal tax burden, as this is an important measure of the efficiency of the fiscal regime in encouraging investment. The marginal effective tax rate (METR) is the ratio of the

FIGURE 5



difference between the pre- and post-tax rates of return, for a marginal investment, to the pre-tax return.⁴⁵ Measured over the life of the project, the METR represents the tax revenue collected on a project at the margin of project viability—one where the investor just breaks even. To measure METR for each country, prices were varied under each fiscal regime to bring the post-tax rate of return down to an assumed hurdle rate of 11% (nominal). The price that brings company returns down to this rate is the “breakeven price”, the lowest price the company could face and still make their required hurdle rate of return.⁴⁶ The results (Figure

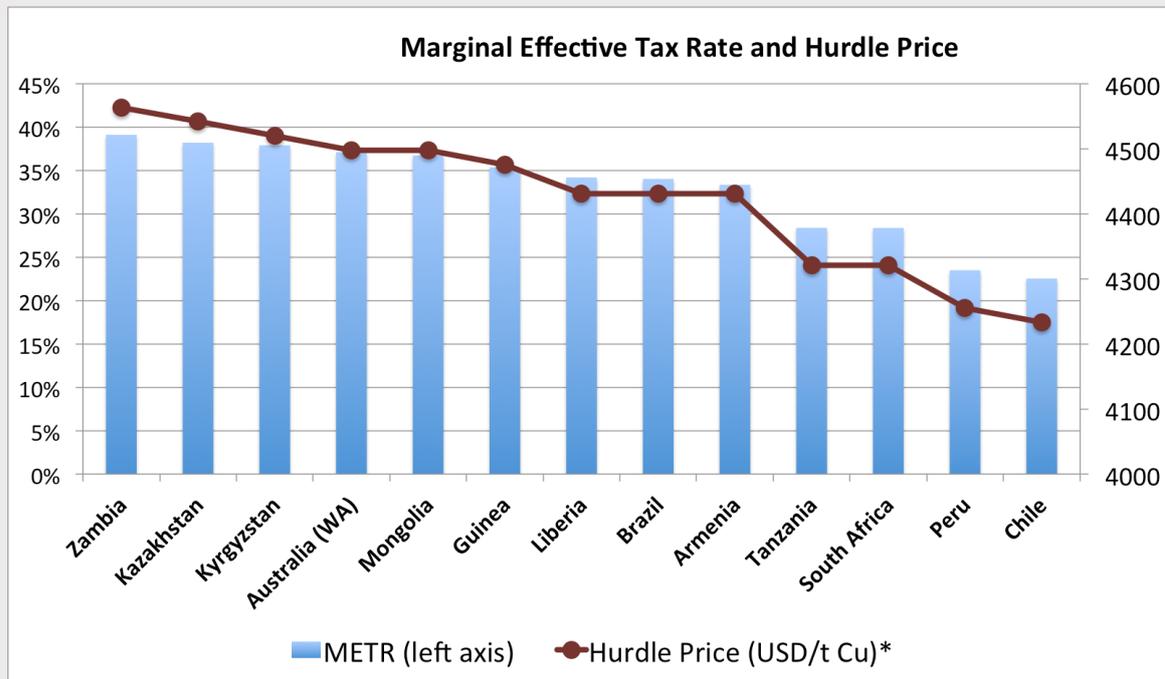
⁴⁴ The model assumes Mongolia has taken the full allowable share of equity. Equity share may be lower in some cases.

⁴⁵ See Daniel, P. (2010)

⁴⁶ Measuring a single “breakeven price” for a poly-metallic mine is impossible, as a price increase on one commodity could offset a price decrease on another. For purposes of modeling simplicity, baseline prices for all commodities were varied by the same percentage. The breakeven price in the figure is the price for copper assuming a uniform price change from the baseline scenario.

6) show that Armenia is close to the middle of the pack in terms of both METR and the hurdle price.

FIGURE 6



The analyses undertaken thus far have been based on certain assumptions regarding commodity prices. While the baseline price assumptions may be reasonable, actual prices over time are guaranteed to differ from these assumptions. While it is possible to test the behavior of the fiscal regime under a number of different price and cost scenarios, each set of assumptions will be imperfect. In addition, even if a model accurately predicted the average long-term price over time, in reality prices are not constant. They rise and fall unpredictably over the course of a project’s life. Thus, it is important to test how the fiscal regime performs under a large number of possible uncertain scenarios.

A Monte Carlo simulation is used to account for the uncertainty surrounding future prices. Instead of a constant price over the life of the project, a randomized price path, based on the historic volatility of copper prices⁴⁷, is generated and the model is used to calculate the returns to the government and the company, pre- and post-tax IRRs, average effective tax rate, etc. Thousands of additional randomized price paths are then generated and the same calculations run. This provides a large data set that allows not only an assessment of average expected values under a variety of scenarios, but also gives an indication of risk through measurement of the coefficient of variation of various indicators.⁴⁸ For instance, if two fiscal

⁴⁷ For the Monte Carlo analysis, gold and molybdenum prices were kept constant and only copper prices were varied for ease of computation.

⁴⁸ The coefficient of variation is a measure of dispersion, showing the extent of variability in relation to the mean of a sample. For example, assume we run a simplified Monte Carlo analysis with just three iterations. For Country A, the NPV figures for the three iterations are 9, 10 and 11. For Country B, the NPV figures are 5, 10 and 15. For both Country A and Country B, the mean NPV is 10, but the dispersion is significantly greater for Country B, while the results in Country A are tightly clustered around the mean. The coefficient of variation for the Country A

regimes, A and B, each have an expected AETR of X%, but the coefficient of variation under regime A is higher than that for regime B, that means that the government is taking on more risk under regime B than under regime A, relative to the expected return, because the probability of ending up close to the expected AETR is lower.

Results of the Monte Carlo analysis are summarized in Table 3.

Table 3: Effects of Price Uncertainty

	Mean post-tax IRR on equity	Coefficient of variation of IRR	Mean investor NPV8 (M USD)	Average discounted payback (years)	Expected AETR (NPV8)	Probability of investor falling below target 10% rate of return	Mean Govt. NPV8 (M USD)	Coefficient of variation of Govt. NPV
Chile	33%	47%	477.37	6	38%	0.0%	259.68	42%
Tanzania	32%	47%	397.91	6	52%	0.1%	350.09	40%
South Africa	31%	48%	365.76	6	58%	0.3%	393.94	41%
Liberia	30%	49%	342.79	7	58%	1.5%	397.12	46%
Zambia	29%	54%	330.35	8	66%	5.1%	448.51	38%
Guinea	29%	52%	331.22	7	62%	1.8%	405.10	34%
Kyrgyzstan	29%	52%	416.32	8	52%	4.8%	319.81	27%
Peru	29%	48%	356.20	7	57%	1.1%	378.33	41%
Armenia	28%	47%	354.18	7	58%	0.8%	387.23	39%
Australia (WA)	27%	48%	280.06	7	69%	2.7%	483.39	41%
Brazil	26%	48%	369.15	8	58%	1.3%	373.86	35%
Mongolia	25%	47%	235.82	7	77%	4.3%	538.71	42%
Kazakhstan	25%	52%	283.67	8	70%	5.7%	471.20	41%

The analysis indicates that Armenia's average expected AETR of 58% is slightly below the group average of 60%. This is likely due to the fact that, under very high profitability scenarios included in the sample, some regimes with highly progressive instruments will have results that push the average up. Average expected NPV to the government in Armenia falls somewhat below the international average of 400M USD. The coefficient of variation of government NPV, however, is exactly the group average of 39%. Thus, Armenia is taking on the same amount of risk as the average country in the sample, but has a slightly lower expected return. This may warrant some fine-tuning of the overall regime at some point.

VI. Conclusion

Armenia's fiscal regime is quite competitive with the group of countries sampled, falling close to global and regional averages for key indicators. It should thus be relatively attractive to

sample is thus substantially lower, indicating that Country A is taking on less risk than Country B for the same expected return.

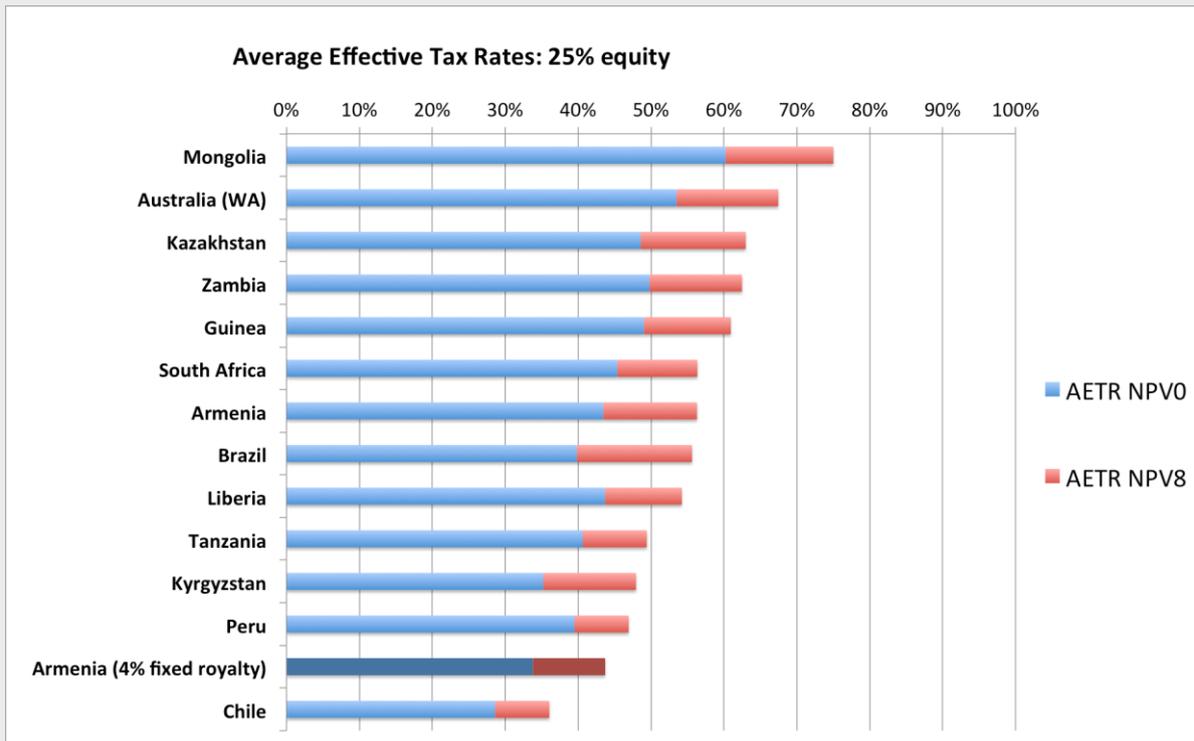
investors while promising strong revenues to the government under a variety of conditions. While there may be scope for fine-tuning the structure of the regime to bring a slight improvement to the risk/return balance at some later date, the balance is reasonable and does not warrant major policy revision so soon after the most recent overhaul of the fiscal regime.

Armenia's fiscal regime puts heavy emphasis on the royalty, and the variable component of the combined royalty is likely to be the largest component of the royalty for many mines. Accordingly, it is crucial that Armenia do what it can to prevent manipulation of the revenue and profit calculations that underlie the rate formula. Understatements of gross revenues or profits will have a compounded effect because they will reduce both the royalty rate and the income tax base. Introduction of strong transfer pricing rules, including disclosure requirements on transactions between related entities, is strongly recommended. The use of "advanced pricing agreements" for related-party transactions, as well as disclosure and documentation rules covering non-arm's-length transactions, may also strengthen tax administration. Caps on management fees may also be advisable. Transfer pricing is equally problematic in non-mining sectors, and Armenia should take up this issue at a countrywide level, rather than as a sector-specific reform. In addition, strengthening Armenia's physical auditing capabilities to ensure accurate volume and quality reporting will be extremely important.

As noted herein, the application of the variable royalty is subject to some uncertainty, with numerous stakeholder in Yerevan sharing the view that most company royalty rates are in the 4-5% range, despite the modeled results suggesting that the royalty rate should be closer to 9% for reasonably profitable mines. If it is true that companies are in fact paying closer to 4% royalties, the reasons for this must be better understood. If the variable portion of the royalty were found to be ineffective, the impact on the assessment of the overall fiscal regime would be quite significant. Figure 7 illustrates the potential impact by modeling the average effective tax rate as if Armenia's royalty were fixed at 4% (i.e., excluding the variable component). In such a case, Armenia's AETR would fall from 56% to 44%, placing it near the bottom of the sample.

If the relevant authorities find they are unable to effectively police the royalty and tax calculations over time, it may be worth looking into other types of variable royalty structures (e.g., adjusting the rate in response to international prices rather than seeking to measure profit), other progressive instruments that are less vulnerable to pricing manipulation, or an increased emphasis on other elements of the fiscal regime (e.g., a higher income tax rate).

FIGURE 7



Additional recommendations:

1. Simplify legal architecture of the fiscal regime by consolidating all elements of the fiscal regime in a single piece of legislation.
2. Consider introducing rules to ring-fence revenue and profit measurement for purposes of calculating the variable royalty.
3. Consider the potential for using LME prices rather than contract value to calculate the royalty base for concentrates; consider measuring production for royalty purposes as far upstream as possible, using the first “measurable point”, rather than the first “marketable point”. An offsetting adjustment to royalty rates may be desirable if either of these changes is implemented.
4. Introduce thin capitalization rules to limit tax losses from excessive debt funding. Review of the allowable interest rates is also recommended.
5. Review the tax stabilization framework and any legacy stabilization provisions currently in effect. Consider eliminating stabilization or sharply limiting its scope.
6. Draft rules clarifying the tax treatment of funds set aside for rehabilitation and closure of mines; there should also be efforts made to ensure that the regulatory system is robust and that rehabilitation funding is sufficient.

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AUA Center for Responsible Mining
American University of Armenia
40 Baghramyan Ave.
Yerevan, Republic of Armenia
+374-60-612520
crm@aua.am
crm.aua.am

mlri.crm.aua.am

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