DESIGN AND EVALUATION OF FISCAL REGIMES FOR EXTRACTIVE INDUSTRIES: AN IMF PERSPECTIVE

Fiscal Affairs Department

USGS National Minerals Information Center

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Focus of presentation

• Guiding principles for extractive industries taxation
• The IMF’s Fiscal Analysis of Resource Industry (FARI) methodology
• Overview of fiscal regimes in selected countries
• Reflecting IMF policy advice and capacity building in developing countries
GUIDING PRINCIPLES FOR EXTRACTIVE INDUSTRIES TAXATION
Defining the fiscal regime

• The combined system of tax and non-tax instruments used to raise government revenue from extraction activity.

• It includes not only conventional instruments such as royalty and corporate income tax, but also resource rent taxes and production sharing.

• It can include state equity participation which have fiscal effect on the revenue sharing even where held by a commercially operating state owned enterprise.
Take account of sector characteristics

- Key revenue source for many countries
- Large upfront capital investment, and long production periods
- Pervasive uncertainty
- Potential for substantial (economic) rents
- Asymmetric information
- Extensive involvement of multinationals in some countries... and of state-owned enterprises in others
- Non-renewable resources (exhaustibility is unique)
Key source of revenue for many developing countries

Government Receipts from Natural Resources, averages 2000-2014
(Selected countries, in percent of total revenue excluding grants)
Pervasive uncertainty... in prices

WEO Copper Price Forecasts 2002-2022
(Monthly Prices, 2016 U.S. Dollar per tonne)

US$ per metric tonne


Sep 2003 Sep 2004 Sep 2005

Sep 2006


Apr 2016 Oct 2017
... and costs

Producer Price Index: Total Mining Industries, 1984=100

Source: Federal Reserve Bank of St. Louis
... but potentially high economic rents

Economic Rent:
Return in excess of project costs including minimum required by investor

Long term expected price

Viable
Not viable

Cumulative production
Extensive involvement of multinationals and state-owned companies...

- Top 40 split between traditional and emerging market companies
- In 2016 three of the 10 largest mining companies were state-owned
- Other significant state-owned companies, such as Chile’s Codelco, which is the largest copper producer in the world.
So what should fiscal regimes aim at?

• Avoid deterring the investment!
• Maximize present value of government revenues...
• ...combined with early and dependable revenue
• Improve adaptability (although higher progressivity means more risk)
• Provide ease of administration (for authorities) and compliance (for taxpayers)
Three main fiscal schemes (sometimes blended)...

1. **Contractual**, including production sharing or service contracts

2. **Tax and royalty**, with licensing of areas

3. **State ownership or participation**
A wide range of possible instruments

- **Bonuses** (with bidding)
  - Rare in mining but sometimes used in mature jurisdictions

- **Royalties**
  - Distort extraction (and, hence, exploration) decisions
  - Can be used in principle to influence extraction path
  - Revenue from start of production

- **Corporate income tax**
  - Tax the normal return on equity
  - Ring-fencing rules
  - International tax issues (Double tax treaties, withholding taxes)
A wide range of possible instruments (2)

• **Rent taxes**
  – Non-distorting in principle...
  – ...but usually combined with distortive taxes
  – Many forms, with different timing of receipts

• **Production sharing (mostly used in petroleum)**
  – Various mechanisms are available
  – Can secure revenue from start of production, and could be designed to increase revenue as profitability increases

• **State participation**
  – Can help resolve asymmetric information
  – But potential governance issues and fiscal costs
What is adopted in practice?

- Fiscal regimes vary greatly among countries (results from 2012 survey)

<table>
<thead>
<tr>
<th>Fiscal Instrument</th>
<th>No. of mining countries (out of 25)</th>
<th>No. of petroleum countries (out of 67)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature bonus</td>
<td>1</td>
<td>16</td>
</tr>
<tr>
<td>Production bonus</td>
<td>None</td>
<td>10</td>
</tr>
<tr>
<td>Royalties</td>
<td>25</td>
<td>50</td>
</tr>
<tr>
<td>Resource rent taxes</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Additional income taxes</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Production sharing</td>
<td>None</td>
<td>34</td>
</tr>
<tr>
<td>State participation</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>Social investments/infrastructure</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
So what would be an attractive fiscal framework?

Country circumstances require tailored advice, but generally within a framework that combines:

• A royalty on gross revenue

• A tax targeted explicitly on rents (and thus on the achieved results of extraction)

• Together with normal corporate income tax

• Bonus-bidding may have a role in mature or promising environments
FISCAL ANALYSIS OF RESOURCE INDUSTRIES (FARI) METHODOLOGY
FARI Main Uses

1. Fiscal regime design and evaluation (our focus today)
   • Can be used to evaluate fiscal terms, assess bids in a competing round, or perform sensitivity analysis

2. Revenue forecasting
   • Composition and timing of expected revenue streams
   • Revenue management and calibration of fiscal rules
   • Integration of forecasts into macro framework

3. Revenue administration
   • Comparing actual, realized revenues with model results (tax gap analysis, risk assessment)
Design Principles

• Excel based, discounted cash flow model structure
• Simple framework that can be easily picked up by analysts with limited experience on natural resource taxation
• Flexible approach to handle diversity in fiscal regimes
• Standard suite of analytical routines and outputs
Project-specific modeling approach

- The interaction of different fiscal instruments is complex and its effects varies from project to project
  - Limited insight from headline tax rates and fiscal parameters
  - For example, appropriate treatment of depreciation, loss carry forwards, and ring-fencing is important
- Thus, modeling should be project specific:
  - Project data, economic assumptions and fiscal regime parameters
  - Project cash flows and fiscal calculations
  - Standardized fiscal outputs and economic indicators
Model Structure

** CONTROL **
- Select project
- Select price
- Economic assumptions

** Analysis **
- AETR
- METR
- Stochastic Analysis
- Sensitivity analysis
- Sectoral Analysis
  - Analysis and comparison between regimes

** Fiscal regimes **
- Country A original
- Country A alternative
- Comparator regime 1
- Comparator regime 2
- Comparator regime 3
- Comparator regime 4
- Comparator regime n
  - Standard templates, tailored to each regime

** Regime Results **
- Consolidates standard set of outputs from each regime

** Project Examples **
- Project 1
- Project 2
- Project 3
- Project 4
- Project 5
- Project n
  - Standardized project examples

** Project Cashflow **
- Escalated costs
- Commodity prices
- Revenues

** Sectoral Analysis **
- Analysis and comparison between regimes

** Stochastic Analysis **
- Analysis and comparison between regimes

** Sensitivity analysis **
- Analysis and comparison between regimes

** AETR **
- Analysis and comparison between regimes

** METR **
- Analysis and comparison between regimes
Indicators commonly used in FARI

**Average Effective Tax Rate**
- Government revenues as a share of pre-tax net cash flow
- Cumulative over project life at various discount rates

**Marginal Effective Tax Rate**
- The tax wedge for a marginal project which just reaches the hurdle rate post-tax

**Share of Total Benefits**
- Government revenues as a share of revenue minus operating cost (quasi-rents)
- Cash flows available to meet investment, return on investment, and taxes

**Breakeven Price**
- Price required to achieve a minimum post-tax IRR required by the investor
BRIEF OVERVIEW OF MINING FISCAL REGIMES IN SELECTED COUNTRIES
Mix of established, small and potential gold producers with different regimes

- Established producers, such as Australia (Western Australia), Ghana, South Africa, and Canada (Ontario)
- And other small and potential producers such as Chile, Brazil, Mongolia, PNG, Liberia, and Zambia
- The fiscal regimes of these countries include a wide range of instruments, such a different type of royalties, CIT, additional profit taxes, and state participation.
Royalties: different variations

• Most countries in the sample have fixed rate royalties levied on the value of production...

• However, Ontario levies its royalties on net profits with the rate varying on the location of the mine;

• PNG royalty base is the net-smelter return or the FOB export value; and

• South Africa’s royalty rates vary as a function of the ratio of EBIT to gross sales and whether the mineral has been refined.
CIT also follows different forms

- Most countries have a fixed rate CIT (some are a combination of national and state/provincial CITs) ranging from 24% to 42%...
- **Chile** offers a higher rate for projects with fiscal stability contracts;
- **PNG** levies a higher rate on non-resident companies;
- **South Africa** and **Zambia** have a variable CIT rate, which depends on the ratio of taxable income to gross income
Additional profit taxes: two cases

- **Chile** applies a specific mining tax (SMT) to companies with sales over 12,000 metric tones per year.
  - The tax base is taxable mining income, the effective rates range from 0.04% and 14%, and the tax is deductible against CIT.

- **Liberia** imposes a resource rent tax (RRT) that is triggered when the pre-tax IRR of a project reaches 22.5%.
  - The tax base is the project cash flows, and the rate is 20%, and the RRT is deductible against CIT.
State participation: three variants

- **Ghana** imposes a 10% free state equity interest on mining projects, which effectively works as a dividend withholding tax (subject to dividend distribution policies)

- **Mongolia** imposes a 34% state equity carried through exploration and development, which is repayable from the start of production with interest

- **PNG** state participation option ranges between 0 to 30%, and it is only carried during exploration, which means the state has a working (fully paid) interest from development
ILLUSTRATION OF FARI MODELING RESULTS
Gold mine: project economics

• An illustrative small/medium gold mine is used for illustration purposes
• The mine produces 2 million ounces of gold over 12 years, reaching a peak production rate of 200,000 ounces in years 3-11.
• With a unit cost of $516/ounce and using the latest WEO price projections, the mine is relatively profitable with a pre-tax IRR of 27.5%
Government take (AETR)

[Correct spelling of “marginal”; what is “invariability regime” for Chile?]

AETR for Selected Regimes

- 20% 40% 60% 80% 100% 120%

Mongolia; Current regime (34% State Equity)
PNG; General regime, 30% state participation
Ghana; Current Regime
Zambia; Current Regime
Chile; Tax invariability Regime
Liberia; Revenue Code 2011 (Current)
Brazil; Current Regime
South Africa; Current regime (gold)
Australia; Western Australia
Canada; Ontario

Marginal
Not viable

Project: GoldMine
Size: 2.0 MM ounces
Unit costs: $516/ounce
Gold price: WEO
IRR pre tax: 27.5%
Breakeven price and METR
Progressivity: government share of total benefits
IMF ADVICE IN KENYA: CASE STUDY
Kenya’s petroleum fiscal regime reform

- Recent discoveries attracted investor interest
- However, fiscal regime dated from the 1980’s
- Kenya asked FAD for technical assistance on tax policy for extractive industries
- FAD fielded various missions between 2013 and 2016 to assist in reforming the fiscal regime for petroleum:
  - New model PSC, with improved petroleum sharing mechanism
  - Revised income tax legislation for the sector
  - Improved capacity building across government ministries on fiscal regime design and fiscal modeling for the sector
For More Information...

Please visit: http://www.imf.org/external/np/fad/fari/
QUESTIONS?