TAXATION REGIME APPLICABLE TO DEEP SEA MINING

COMPARATIVE ANALYSIS AND CASE STUDY

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OUTLINE

- Terrestrial Mining – key components of taxation regimes worldwide
- Terrestrial vs Deep Sea Mining
- A suggested approach to a DSM Tax Regime
- Case Study
- Findings, Issues for Discussion
Plucking the golden goose...

The art of taxation consists in so plucking the goose as to get the most feathers with the least hissing.  ~Jean Baptist Colbert, attributed
<table>
<thead>
<tr>
<th>Component</th>
<th>Rate/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income tax</td>
<td>30%</td>
</tr>
<tr>
<td>Dividend withholding tax</td>
<td>15%</td>
</tr>
<tr>
<td>Royalties (ad valorem)</td>
<td>2-5%</td>
</tr>
<tr>
<td>Import duty on equipment</td>
<td>none</td>
</tr>
<tr>
<td>Export duty on minerals</td>
<td>none</td>
</tr>
<tr>
<td>VAT</td>
<td>zero rated</td>
</tr>
<tr>
<td>Depreciation</td>
<td>accelerated &amp; pooled</td>
</tr>
<tr>
<td>Depletion</td>
<td>none</td>
</tr>
<tr>
<td>Ring fencing</td>
<td>none</td>
</tr>
<tr>
<td>Exploration</td>
<td>amortized (5 yr)</td>
</tr>
<tr>
<td>Environmental costs</td>
<td>expensed</td>
</tr>
<tr>
<td>Closure costs</td>
<td>deductible closure fund</td>
</tr>
<tr>
<td>Tax holidays</td>
<td>none</td>
</tr>
<tr>
<td>Loss carry forward</td>
<td>7 year or unlimited</td>
</tr>
</tbody>
</table>
Principles underlying Mining Taxation Regimes
(adapted from Dr. G. Hancock, World Bank)

Government/Community Requirements

- Encourage mineral investment
- Encourage value adding and multiplier effects
- Encourage exploration and diligent work commitments
- Encourage R&D, knowledge & Technology Transfer
- Obtain fair share of sales of mineral products
- Maximize the value of tax revenue
- Support macroeconomic stability by providing predictable and stable tax revenues
- Be effective with low-cost administration
- Discourage tax avoidance
- Encourage exploration and expansion of the tax base
A Government’s view on Tax....

“The government’s view of the economy could be summed up in a few short phrases: If it moves, tax it. If it keeps moving, regulate it. And if it stops moving, subsidize it.”

President Ronald Reagan
Principles underlying Mining Taxation Regimes
(adapted from Dr. G. Hancock, World Bank)

Investor/Company Requirements

- Maximize the net present value of the company’s revenue
- Be based on realized profitability
- Permit early pay-back of capital
- Recognize the volatility of markets
- Be stable and predictable
- Transparent
- Avoid tax types that distort extraction profiles
- Avoid tax types that penalize increased efficiency
- Encourage investment in exploration
- Encourage investment in marginal mines
A Company’s view on Tax....
You must pay taxes. But there's no law that says you gotta leave a tip.

*Morgan Stanley advertisement*
Taxman vs Taxpayer....The taxation dilemma: determining what is fair!
## Fundamental Differences

<table>
<thead>
<tr>
<th>Terrestrial</th>
<th>Deep Sea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock overburden</td>
<td>Ocean depth cover</td>
</tr>
<tr>
<td>Primary removal by drill &amp; blast</td>
<td>Primary removal by earthmoving</td>
</tr>
<tr>
<td>Processing stream in small area</td>
<td>Processing stream in both sea and land</td>
</tr>
<tr>
<td>Technology proven</td>
<td>Technology borrowed, WIP</td>
</tr>
<tr>
<td>High Energy requirement</td>
<td>Extremely high Energy requirement</td>
</tr>
<tr>
<td>Simple mineral processing</td>
<td>Very complex mineral processing</td>
</tr>
</tbody>
</table>
TERRESTRIAL VS DEEP SEA MINING

Challenges of Deep Sea vs Terrestrial Mining

- Very high exploration risk
- Very high capital requirement
- Cover vast areas
- Involve highly sophisticated machinery and technology
- Environmental impact and stakeholder scrutiny is very sensitive
- High energy requirement
- Issues with national claims beyond EEZ
- Policy and regulatory framework still under formulation
TERRESTRIAL VS DEEP SEA MINING

- Minerals to Tax from Deep Sea Mining
  - *Manganese nodules*: copper, nickel, cobalt
  - *Cobalt-rich magnesium crust*: platinum, nickel, copper and up to 3-5X cobalt than manganese nodules
  - *Polymetallic sulphide deposits*: copper, zinc, lead, silver, gold
- Complex mineral taxation formula and approach is inherent
- Mineral Processing is a key factor
HOW TO FORMULATE A COMPETITIVE TAXATION REGIME

- Keep Government and Company’s perspective in balance: *balancing economic benefits maximization against resource extraction optimization*
- Comparative analysis of **Effective Tax Rates** (ETR) to position a country competitively
- Comparative analysis of **Internal Rate of Return** (IRR) to position a company competitively

Source: Otto, Hancock
EFFECTIVE TAX RATE (ETR)

\[
\text{Effective Tax Rate} = \frac{\text{Value of all amounts paid to government}}{\text{Value of profits before taxes are paid}}
\]

- Measures the combined impact of all taxes
- Useful for comparative analysis of taxation regimes
- Ideal range is between 40-50% to ensure proper risk versus return considerations
Model Copper Mine: Comparative Effective Tax Rates

Effective Tax Rate - %

Ideal range: ETR = 40 to 50%

From Otto 2006, Hancock
### Comparison of ETRs for 2006-2008 for Selected Mining Companies, Source: PWC

<table>
<thead>
<tr>
<th>Company</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zijin Mining</td>
<td>17.8%</td>
<td>20.6%</td>
<td>14.1%</td>
</tr>
<tr>
<td>Xstrata</td>
<td>45.4%</td>
<td>-</td>
<td>28.7%</td>
</tr>
<tr>
<td>Vedanta Resources</td>
<td>30.0%</td>
<td>27.1%</td>
<td>27.4%</td>
</tr>
<tr>
<td>Vale Inco</td>
<td>18.3%</td>
<td>21.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>Teck Cominco</td>
<td>33.7%</td>
<td>31.7%</td>
<td>47.2%</td>
</tr>
<tr>
<td>Stillwater</td>
<td>-0.5%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Southern Copper Corporation</td>
<td>31.9%</td>
<td>34.8%</td>
<td>32.5%</td>
</tr>
<tr>
<td>Rio Tinto</td>
<td>23.2%</td>
<td>25.3%</td>
<td>46.0%</td>
</tr>
<tr>
<td>OZ (formerly Zinifex)</td>
<td>39.9%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Newmont</td>
<td>26.1%</td>
<td>8.8%</td>
<td>-</td>
</tr>
<tr>
<td>Newcrest</td>
<td>25.5%</td>
<td>10.1%</td>
<td>18.3%</td>
</tr>
<tr>
<td>Lonmin plc</td>
<td>31.9%</td>
<td>42.0%</td>
<td>27.0%</td>
</tr>
<tr>
<td>Lihir Gold</td>
<td>29.1%</td>
<td>32.7%</td>
<td>32.9%</td>
</tr>
<tr>
<td>KGHM Polska Miedz</td>
<td>13.5%</td>
<td>17.7%</td>
<td>-</td>
</tr>
<tr>
<td>Kazakhmys</td>
<td>17.7%</td>
<td>17.2%</td>
<td>18.5%</td>
</tr>
<tr>
<td>Kaiser</td>
<td>34.8%</td>
<td>29.6%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Impala Platinum</td>
<td>37.4%</td>
<td>34.7%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Hill Gold</td>
<td>31.1%</td>
<td>25.0%</td>
<td>-</td>
</tr>
<tr>
<td>Gold Fields</td>
<td>36.6%</td>
<td>36.8%</td>
<td>29.2%</td>
</tr>
<tr>
<td>Gold Corp</td>
<td>26.0%</td>
<td>27.6%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Freeport-McMoRan</td>
<td>43.0%</td>
<td>39.0%</td>
<td>21.0%</td>
</tr>
<tr>
<td>BHP Billiton</td>
<td>27.3%</td>
<td>27.7%</td>
<td>28.9%</td>
</tr>
<tr>
<td>Barrick Gold</td>
<td>22.2%</td>
<td>23.0%</td>
<td>40.7%</td>
</tr>
<tr>
<td>Antofagasta</td>
<td>23.3%</td>
<td>23.2%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Anglo Platinum</td>
<td>28.6%</td>
<td>34.4%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Anglo American</td>
<td>27.6%</td>
<td>30.5%</td>
<td>28.6%</td>
</tr>
<tr>
<td>ALCOA</td>
<td>24.3%</td>
<td>33.8%</td>
<td>43.2%</td>
</tr>
</tbody>
</table>

-80.0% -60.0% -40.0% -20.0% 0.0% 20.0% 40.0% 60.0% 80.0% 100.0% 120.0% 140.0%
INTERNAL RATE OF RETURN (IRR)

- Interest or discount rate at which NPV of projected cashflows is equal to ZERO.
- Measures the return on capital invested and used for comparing different investments.
- The higher the IRR, the larger the returns to investment.
- IRR for mining companies is normally 12% or higher, and varies with investment risk.
<table>
<thead>
<tr>
<th>Country</th>
<th>Investor’s Internal Rate of Return (%)</th>
<th>Effective Tax Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest taxing quartile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>15.7</td>
<td>28.6</td>
</tr>
<tr>
<td>W. Australia</td>
<td>12.7</td>
<td>36.4</td>
</tr>
<tr>
<td>Chile</td>
<td>15.0</td>
<td>36.6</td>
</tr>
<tr>
<td>Fiji (no royalty)</td>
<td>14.5</td>
<td>37.6</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>13.5</td>
<td>39.8</td>
</tr>
<tr>
<td>Argentina</td>
<td>13.9</td>
<td>40.0</td>
</tr>
<tr>
<td>China</td>
<td>12.7</td>
<td>41.7</td>
</tr>
<tr>
<td>Fiji (2% royalty)</td>
<td>13.6</td>
<td>42.0</td>
</tr>
<tr>
<td>Second lowest taxing quartile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PNG</td>
<td>13.3</td>
<td>42.7</td>
</tr>
<tr>
<td>Bolivia</td>
<td>11.4</td>
<td>43.1</td>
</tr>
<tr>
<td>Fiji (3% Royalty)</td>
<td>13.2</td>
<td>44.1</td>
</tr>
<tr>
<td>South Africa</td>
<td>13.5</td>
<td>45.0</td>
</tr>
<tr>
<td>Philippines</td>
<td>13.5</td>
<td>45.3</td>
</tr>
<tr>
<td>Indonesia (7th, COW)</td>
<td>12.5</td>
<td>46.1</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>12.9</td>
<td>46.1</td>
</tr>
</tbody>
</table>

Source: Otto, Hancock

Comparison of IRR vs ETR for Selected Countries, circa 2003
A SUGGESTED APPROACH

- KISS PRINCIPLE
- Do not re-invent the wheel
- Differentiate risk/return criteria, terrestrial vs sea bed mining factors
- Apply an EFFECTIVE TAX RATE (ETR) for comparative analysis – Government’s viewpoint
- Apply an INTERNAL RATE OF RETURN (IRR) for comparative analysis – Company’s viewpoint
CASE STUDY

- SMS Project, benchmarked to the Solwara 1 Nautilus Project in PNG
- Taxation base case is the universal competitive taxation regime for terrestrial mining (ala Otto, Hancock)
- Key Assumptions:
  - Initial Capex: USD400 million, total Opex USD70/tonne
  - Current Commodity prices discounted by 40%
  - 3,429 dry tonnes per day mined and processed (1.2Mt per annum)
  - Insitu grade: Cu (5%), Au (4 g/t), Ag (20 g/t), Zn (0.5%)
  - Various recoveries in 2 processing streams reporting to a Cu Conc and Zinc Conc
  - 60% of Initial Capex borrowed
  - Mine Life, 10 years
  - Assume Onshore processing
TAXATION BASE CASE

- Income tax: 30%
- Dividend withholding tax: 15%
- Royalties (ad valorem): 2%
- Import duty on equipment: none
- Export duty on minerals: none
- VAT: zero rated
- Depreciation: accelerated & pooled
- Depletion: none
- Ring fencing: none
- Exploration: amortized (5 yr)
- Environmental costs: expensed
- Closure costs: deductible closure fund
- Tax holidays: none
- Loss carry forward: 7 year or unlimited

ETR = 35%  Over mine life, IRR = 47%
Total Government Taxes = USD374 million
Cumulative Net Profit = USD631 million
NPV @12% discount = USD250 million
TAXATION SCENARIO ONE

- Income tax: 25%
- Dividend withholding tax: 10%
- Royalties (ad valorem): 2%
- Import duty on equipment: none
- Export duty on minerals: none
- VAT: zero rated
- Depreciation: accelerated & pooled
- Depletion: none
- Ring fencing: none
- Exploration: amortized (5 yr)
- Environmental costs: expensed
- Closure costs: deductible closure fund
- Tax holidays: none
- Loss carry forward: 7 year or unlimited

ETR = 31% Over mine life, IRR = 48%
Total Government Taxes = USD325million
Cumulative Net Profit = USD677million
NPV @12% discount = USD266million
TAXATION SCENARIO TWO

- Income tax: 30%
- Dividend withholding tax: 15%
- Royalties (ad valorem): 3%
- Import duty on equipment: 5%
- Export duty on minerals: none
- VAT: zero rated
- Depreciation: accelerated & pooled
- Depletion: none
- Ring fencing: none
- Exploration: amortized (5 yr)
- Environmental costs: expensed
- Closure costs: deductible closure fund
- Tax holidays: none
- Loss carry forward: 7 year or unlimited

ETR = 42% Over mine life, IRR = 40%
Total Government Taxes = USD 425 million
Cumulative Net Profit = USD 605 million
NPV @ 12% discount = USD 219 million
## Summary of Simulations

<table>
<thead>
<tr>
<th>Scenario</th>
<th>ETR</th>
<th>IRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Case</td>
<td>35%</td>
<td>47%</td>
</tr>
<tr>
<td>Base Case + 25% Corp Tax, 10% DWT, 2% Royalty</td>
<td>31%</td>
<td>48%</td>
</tr>
<tr>
<td>Base Case + 3% Royalty, 5% Import Duty</td>
<td>42%</td>
<td>40%</td>
</tr>
</tbody>
</table>
Findings

- Commodity prices used should be discounted for long term projections due to current high prices.
- Deep Sea Mining far more profitable than Terrestrial mining due to high grades.
- Key tax incentives should be at the front-end and related to capex and how it impacts on IRR.
- ETR should be no less than 40% if IRR is no less than 20%, but high IRR required to amortise large capex.
Issues for Discussion

• An applicable taxation regime can be formulated, but need transparency, partnership between govt and company to derive optimal ETR/IRR trade-off
• Multi-Jurisdictional Issues: national vs regional
• Landowner equity: which philosophy?
• Value Adding a key component for host country
Issues for Discussion, cont’d

- Energy is an issue for processing. So is supporting infrastructure.
- Environmental impact still a concern for island communities. How to mitigate and costs involved unknown. **CBA may focus policy discussions.**
- More focus should be on **economic multipliers** rather than just taxation regime/direct benefits.
Thank You

The greatest of all gifts is the power to estimate things at their truth worth. *LaRockefoucauld*