



Project Valuations – SRK's View

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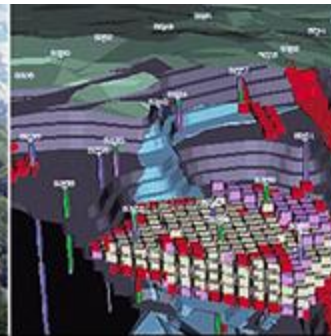
Key Facts about SRK

Highlights

- Established in 1974
- Over 1,500 staff and 150 associates
- Provide specialist services
- Primarily in mining industry
- Owned by employee shareholders



exploration



development



operations



closure

Valuation Portfolio

Project Valuations Supporting

- Feasibility studies
- Audits/due diligences/IE investigations
- Benchmarking
- Financing and Stock Exchange listings
- M&A transactions
- Litigation and arbitration clauses



By Geography

- Offices in 24 countries
- Located on 6 continents

By Commodity

- Base and precious metals
- Ferrous and speciality metals
- REE
- Coal, uranium, oil sands
- Industrial minerals

Presentation focus:

Valuation of mining development projects from scoping through Execution stages using the income approach

Project Valuation Complications

Mainly result from lack of full knowledge of:

- Ore body
- Site conditions

Any of which, or combination of, can affect the valuation of a project-
“Different courses for different horses”



Ore Body Issues

- Database integrity – bad data
- Geologic interpretation – wrong geological model
- Resource estimation – geologic controls, grade capping analysis, appropriate compositing wrt mining selectivity

All of these common issues affect mineral resource confidence classifications



Site Conditions Issues

Technical

- Mining – dilution, schedule
- Process – met testing, representativeness
- Infrastructure – scale, assembling consortiums
- Geography – arctic vs. rainforest, desert vs. alpine

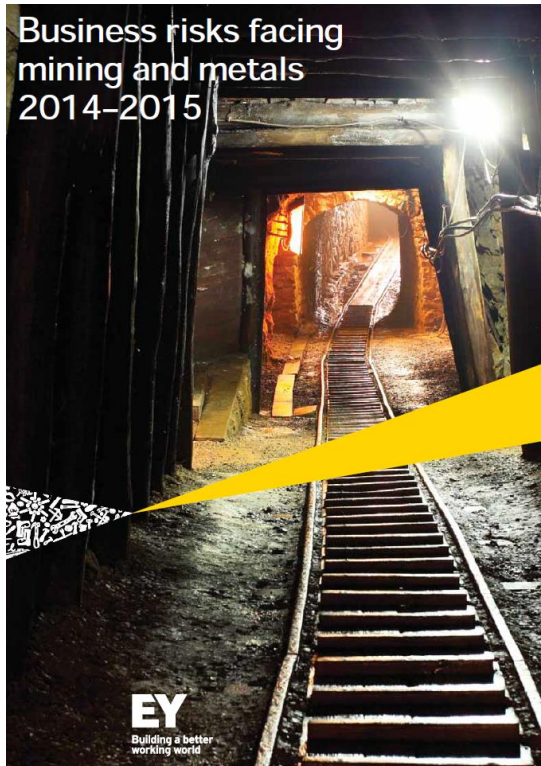
Resource Nationalism

Social License to Operate (SLO)

Will focus on these latter two issues
wrt project valuations



Ernst & Young 2014-15 Mining Risks



1. Productivity improvement
2. Capital dilemmas
3. SLO
4. Resource nationalism
5. Capital projects
6. Price and currency volatility
7. Infrastructure access
8. Sharing the benefits
9. Balancing talent requirements
10. Access to water and energy

Resource Nationalism

1. Mandated beneficiation/export taxes (Indonesia Cu and Ni)
2. Retaining or mandating state/in-country ownership of natural resource (Venezuela)
3. Increased or newly imposed taxation regimes (many places)



Taxation

In this world nothing can be said to be certain, except death and taxes.

– Benjamin Franklin,
1789

Risk #1

Countries are keen to gain a greater share of shrinking returns from the sector



Australia treasurer vows to block Glencore-Rio Tinto merger

Cecilia Jamasmie | April 8, 2015



Iron ore plunge to blow \$3.6B hole in WA budget

Andrew Topf | April 5, 2015

Markets | Tue Apr 14, 2015 6:16am EDT

Related: STOCKS, REGULATORY NEWS, MARKETS

UPDATE 1-Zambia sets mining royalties at 9 pct - presidency source

Taxation

Risk #2

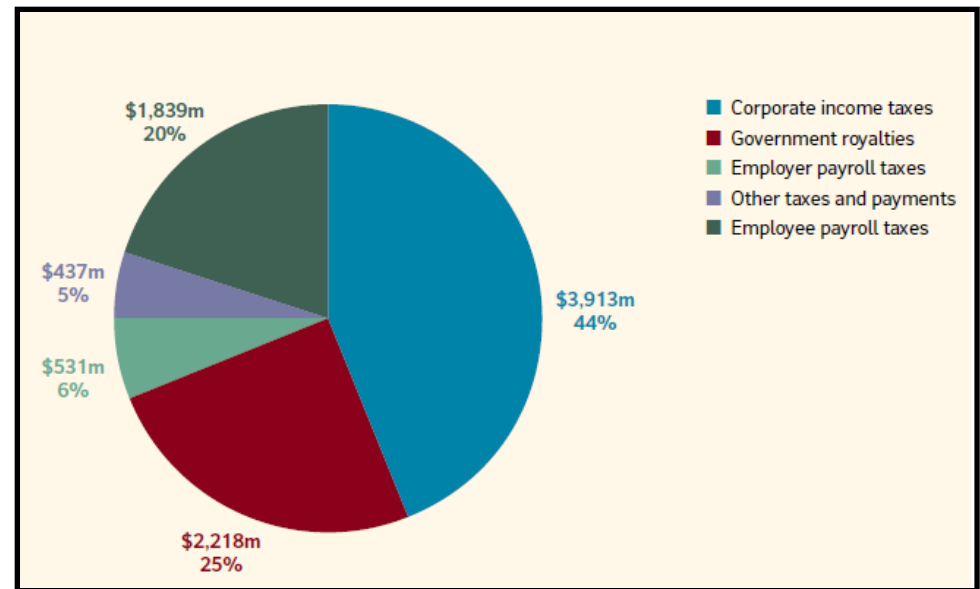
Disclosures rules are in progress requiring reporting of all payments, including taxes, made to foreign governments by mining companies

1. Global: Extractive Industries Transparency Act (EITA); and
2. USA: Dodd-Frank section 1504 amendment

The hardest thing in the world to understand is the income tax.

– Albert Einstein

Taxation – Disclosure Rule Risks



SNLFinancial

Monday, April 06, 2015 9:18 PM MT

Report: BHP Billiton, Rio Tinto face tax avoidance probe



Taxation

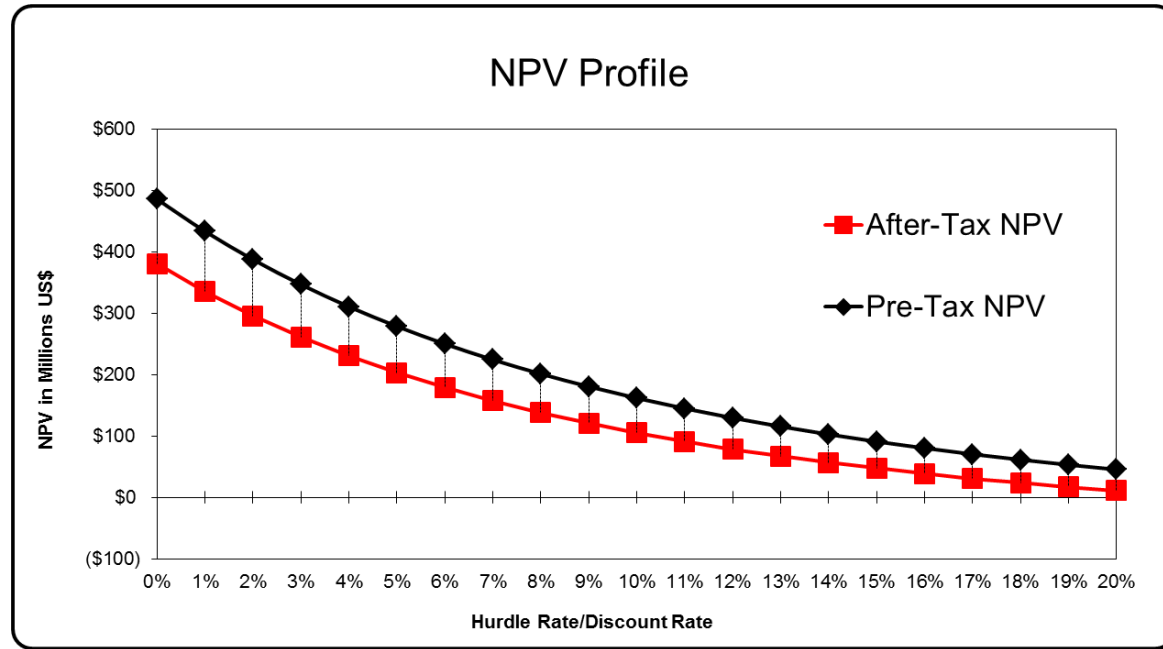
IMF definitions of taxation regimes (Sunley and Baunsgaard, 2000)

1. Royalty/mining tax/severance tax – allows governments to secure minimum payment and maximize revenue stability
 - a. Production (based on volume of minerals extracted)
 - \$/t ore mined
 - b. Ad valorem (based on value of minerals extracted)
 - Gross revenue
 - NSR (gross revenue less TC\RC & freight costs)
 - Profit (NSR less OpEx)
2. Corporate Income tax – applicable to all companies and imposed on normal return and rent
3. Resource rent tax – to capture a larger share of higher return and rent projects

Plus a whole series of indirect general and mining-specific taxes like import duties and VAT but these are generally reimbursed.

Taxation – Impact on Valuation

Major effect - must be accounted for!

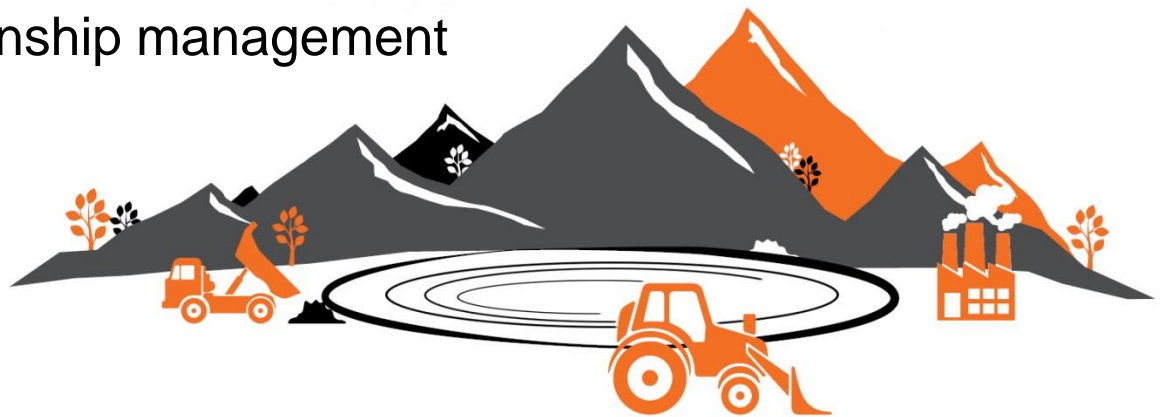


After-tax discounted cash flow analysis using the Income Approach is also a form of risk assessment

There's one for you, nineteen for me.
– Taxman, The Beatles, 1966

Social License to Operate – what is it?*

1. Land access, acquisition, compensation, and resettlement
2. In-migration
3. Community health, safety, and security
4. Environmental impacts
5. Cultural heritage
6. Local employment
7. Local procurement
8. Social investment
9. Community relationship management



* Gov't of Canada – CSR Checklist for Canadian Mining Companies Working Abroad, 2015

SLO – Can it be quantified?

Davis and Franks, 2011

- Most frequent conflict-related SLO costs identified by interviewees were associated with lost productivity and opportunity costs.
- However, many saw a real need for community relations staff to learn the “language of costs.”



SLO Costs – Tough to quantify in cases

SLTO Categories	Project	Description	Cost (US\$)
Land Access	Las Bambas, Peru	Move 4000 people from village at foot of main ore body to newly constructed town 3 km away.	\$600M
In-migration	Lumwana, Zambia	In-migration occurred when mine during original construction and will continue with expansion	
Community Health, Safety and Security	Reko Diq, Pakistan	Concentrate pipeline was planned over uncontrolled tribal areas. ESR inspection used remote sensing due to safety concerns.	
Environmental Impacts	Eagle Mine, MI	Community objections about potential ARD led regulators to insist on additional Reverse Osmosis water treatment plant and Temporary Rock Storage Facility which exceeded permitting standards.	\$10M RO plant / \$8M TRSF
Cultural Heritage	Aynak, Afghanistan	11 th Century Buddhist monastery and mining complex on site requiring archeological studies	
Local Employment	Boleo, Mexico	Company couldn't find enough skilled local labor and mine plan was not met.	
Local Procurement	Eagles Nest, Canada	Requiring First Nations subcontractors to build parts of the \$1B access road in northern Ontario	
Social Investment	Golouma, Senegal	Set up a social program, as legally required, focused on education and clean water supply. Also provided medical assistance and health training to local communities.	
Community Relationship Mgmt	Twin Metals, MN	Both Twin Metals and Polymet had local offices well in advance of the project	

SLO Costs – not well defined in projects

African brownfields gold project has US\$50m in SLO-related initial CapEx out of US\$460m (~11%). Land access and in-migration were ranked 1 and 2 on the project R&O register

WBS Facility	WBS Facility Description	US\$ millions
0000	Mine	41
1000	Process	60
2000	Residue Mgmt	20
3000	Infrastructure	42
	Subtotal Direct Capex	163
4000	Construction Indirects	42
5000	Owners Cost	157
	Total Capex Before Contingency	362
6000	Contingency (27%)	98
	Total Capex	460



Work Breakdown Structure (WBS) - used to organize project capital costs

SLO Costs – not well defined in projects

In Owner's Cost facility, but where?

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WBS Sub-Facility	WBS Sub-Facility Description	US\$ in millions
5100	Project Services	50
5200	Operational Support	60
5300	Site Expense	10
5400	Commissioning	10
5500	Pre-production ramp up	17
5600	Hedging Gain/Loss	-
5700	Capitalized Interest	10
	Total OC Capex	157

SLO Costs – not well defined in projects

3rd level in the project WBS in Operational Support!

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	5200 Operational Support	60
4000	5300 Site Expense	10
5000	5400 Commissioning	10
	5500 Pre-production ramp up	17
6000	5600 Hedging Gain/Loss	-
	5700 Capitalized Interest	10
	Total OC Capex	157



WBS Sub-Facility Detail	WBS Sub-Facility Detail Description	US\$ millions
520	Ops Support + Maintenance	10
521	Mine ESR/Permitting	50
5210	Land Access	10
5211	In-migration	10
5212	Community Health, Safety, and Security	-
5213	Environmental Impacts	10
5214	Cultural Heritage	-
5215	Local Employment	-
5216	Local Procurement	-
5217	Social Investment	10
5218	Community/Gov't/Institution Relations	10

SLO Costs – needs better visibility in projects

Recommend moving these costs to show same level of visibility as the major cost categories (mine, process, etc.) in capital estimates.

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1000	Process	60
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3000	Infrastructure	42
	Subtotal Direct Capex	163
4000	Construction Indirects	42
5000	Owners Cost	107
6000	SLO Costs	50
	Total Capex Before Contingency	362
7000	Contingency (27%)	98
	Total Capex	460



SLO Costs – not well defined in operations either

- Same level of obscurity can exist in a company Chart of Accounts used for recording operating costs during commercial production phase.
- SLO costs generally are defined as indirect cash costs. Most companies focus on reporting direct cash costs or total AISC.



SLO – Impact on Valuation

Productivity and opportunity costs associated with SLO issues are difficult to assess in valuation, but:

- Can develop a database from which costing rules of thumb and guidelines can be developed (corporate and academia)
- Keep SLO costs quantified in easily visible WBS (development) and Chart of Accounts (operations) categories
- SLO-related staff should be trained in the “language of costs”
 - Financial staff to give them framework



Project valuations must include all relevant factors, not just geological and technical.

Thank you/Questions?

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Photo credit: Matt Santomarco



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