

USING MODELING FOR FISCAL RISK ASSESSMENT



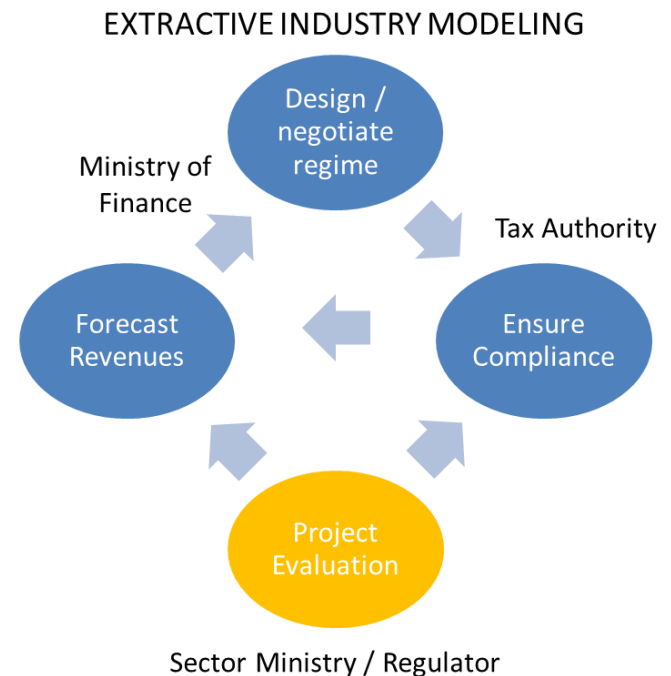
Scott Shelton and Alistair Watson
Fiscal Affairs Department

Fiscal Management of Mining and Petroleum in West Africa, February 2018

Agenda

Fiscal Risk Assessment and Compliance Modeling: An emerging and potentially high-value application of the FARI methodology

- What is a Risk-Based Compliance Strategy?
- What role can fiscal modeling play in this process?
- Linkage to / contrast with policy and revenue forecasting modeling
- Examples from Mozambique and elsewhere
- Process
- Challenges



Risk Based Compliance Strategy

“A high level plan which brings together a description of the most significant risks identified in the tax system and details strategies as to how the revenue authority intends to respond to these risks”

Provides a basis for the Revenue Authorities to properly allocate its limited resources

Risk Based Compliance Strategies

A compliance management strategy requires:

- ✓ A framework to identify analyze and prioritize risks
- ✓ Understanding and recognition of causal affects of non-compliance;
- ✓ Use of multiple remedies across multiple functional lines to address non-compliance;
- ✓ Clear comprehensive strategy to address the most serious risks.

Modeling → Quantification → Prioritization

Using project models for fiscal risk analysis

1. Understanding the projects
2. Understanding the fiscal regime
3. Identifying fiscal risks
4. Quantifying the risks
5. Prioritizing risks and designing compliance activities

Backward looking: verifying past tax returns and “history matching”

Forward looking: planning future compliance activities, as well as comprehensive project-specific revenue forecasts

The process of building and populating a model builds understanding:
this is a valuable exercise in itself

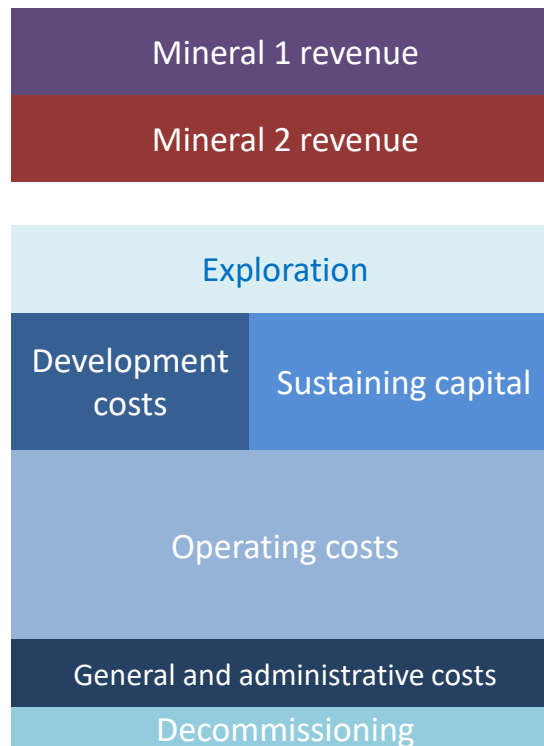
Identifying key risks

| Risk area | Modeling approach | Risk assessment |
|---------------------------------|---|---|
| Revenues | <ul style="list-style-type: none"> • Production, sales and stockpile reconciliation • Realized prices and revenues | Replicate royalty calculations; deductions; rates |
| Costs | <ul style="list-style-type: none"> • Cost by Activity • Cost by Category • High-risk categories: (related party; international; transfer pricing) | Trend / ratio analysis and benchmarking Quantify fiscal risk from transfer mis-pricing |
| Financing costs | <ul style="list-style-type: none"> • Understand financing structures & terms by replicating the calculations • Interest deducted directly versus capitalized into costs | Quantify impact on fiscal revenues (often much greater than expected) |
| Fiscal regime | <ul style="list-style-type: none"> • Clarify regime interpretation • Replicate calculations | Replicate/Reconcile to tax returns |
| International tax issues | <ul style="list-style-type: none"> • Ownership (equity & debt) structure; Affiliate transactions; Withholding tax applicability; Double tax agreements | Quantify impact on revenues; Identify treaty shopping |

Mining project transactions

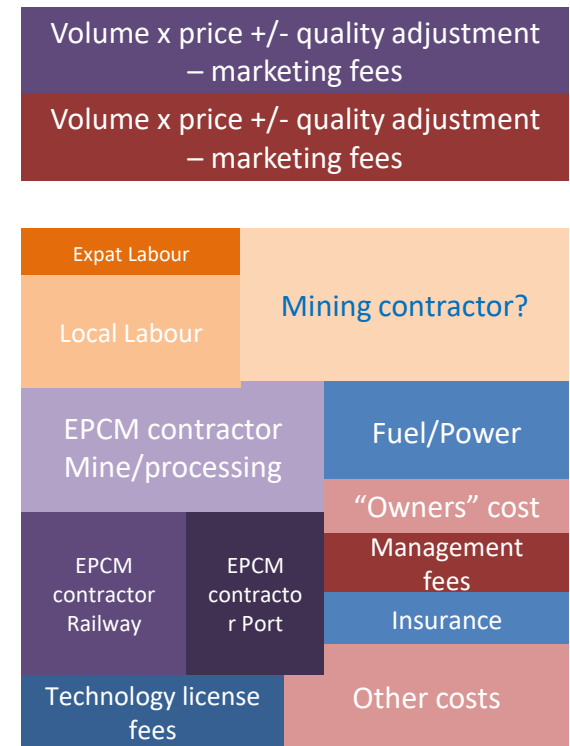
- What transactions
- Who with
- How sourced (tendered?)
- How priced
- How contracted/ documented
- Which jurisdictions involved
- Any related parties?

By Activity



Not to scale: for illustrative purposes only

By category

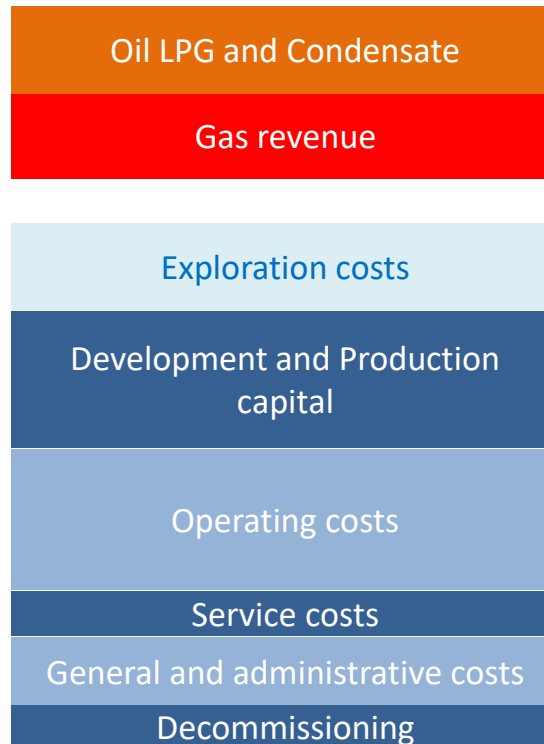


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Oil & gas project transactions

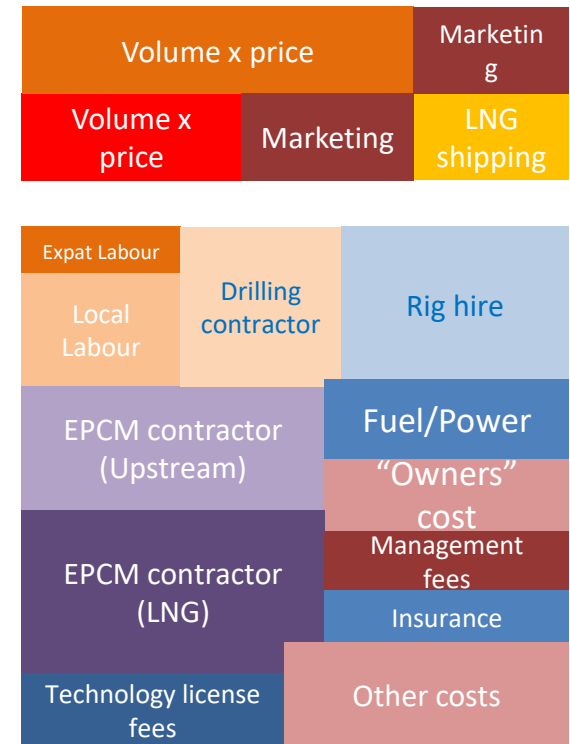
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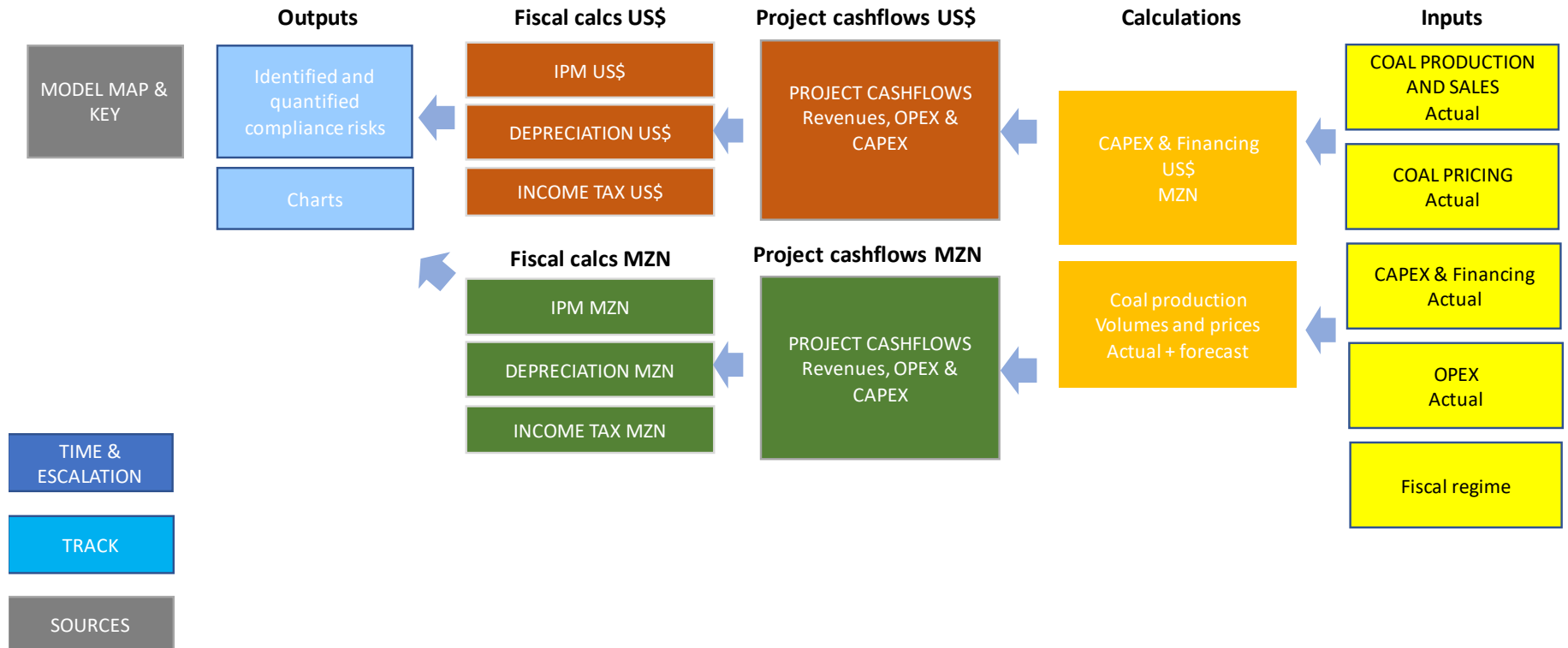
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By category



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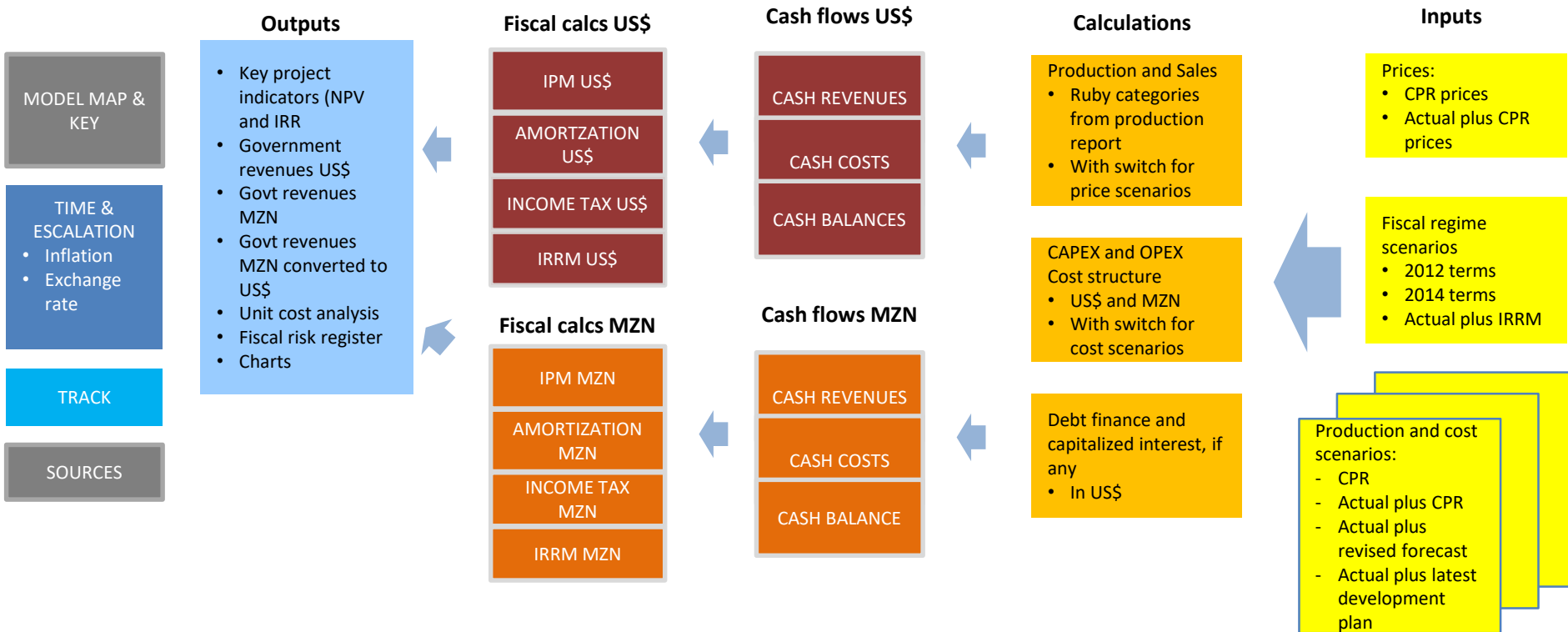
Risk Assessment Model Example: Mozambique Coal Mine



Mozambique coal project: issues identified

- Still in early stages; sorting out data collection challenges & inter-institutional issues
- But the model is already providing valuable risk-identification benefits
 - ✓ First ever evaluation of realized coal prices versus international benchmarks
 - ✓ Quantification of impact of debt finance
 - ✓ Quantification of local currency devaluation on tax calculations
 - ✓ Verification of transport cost tariffs and royalty deductions
 - ✓ Interpretation of special fiscal concessions
 - ✓ Other potential focus: related party transactions
- Will provide a robust basis for revenue forecasting for Ministry of Finance; Bank of Mozambique
 - When will the project start paying income tax?
- Data collection process has prompted a review of royalty assessment process & addressing inter-institutional issues

Risk Assessment Model Example: Mozambique Ruby Mine

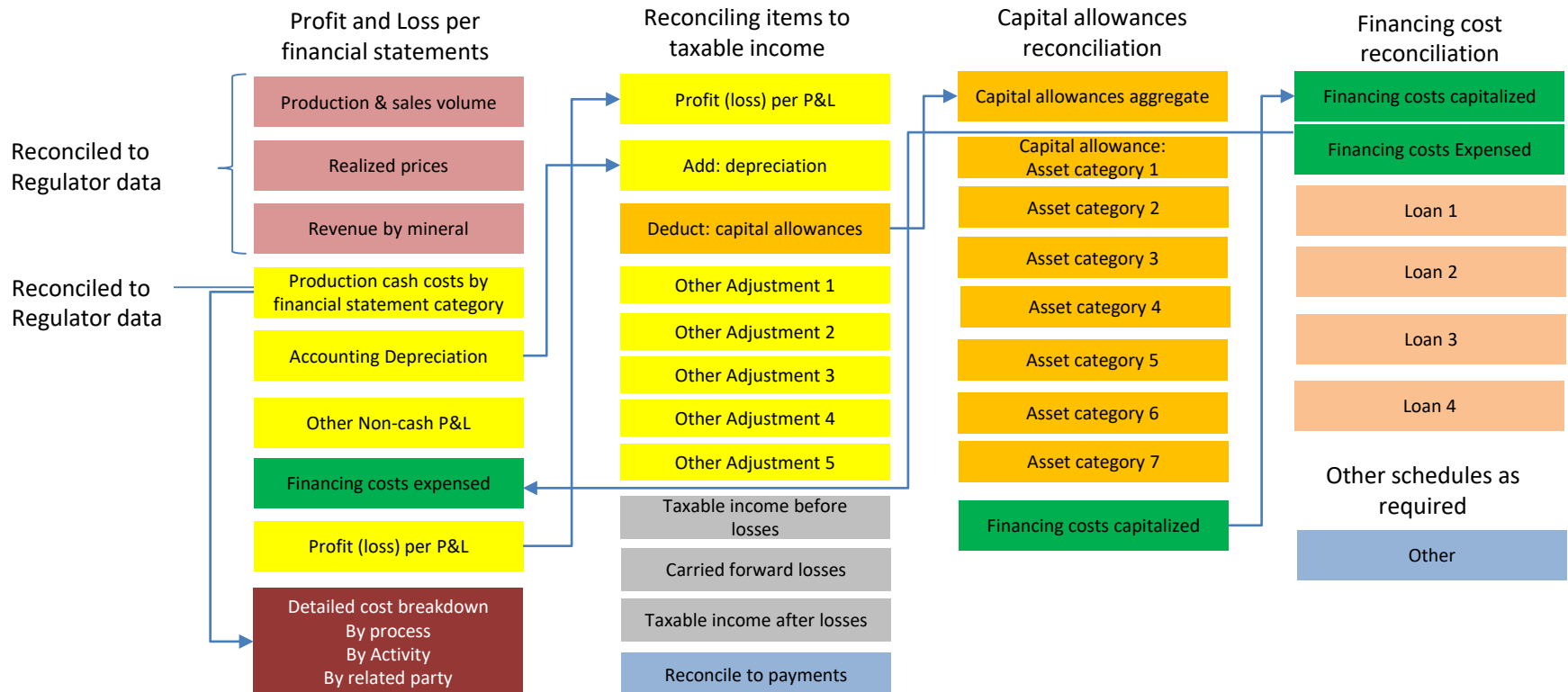


Similar design, tailored to specifics of each project and fiscal regime

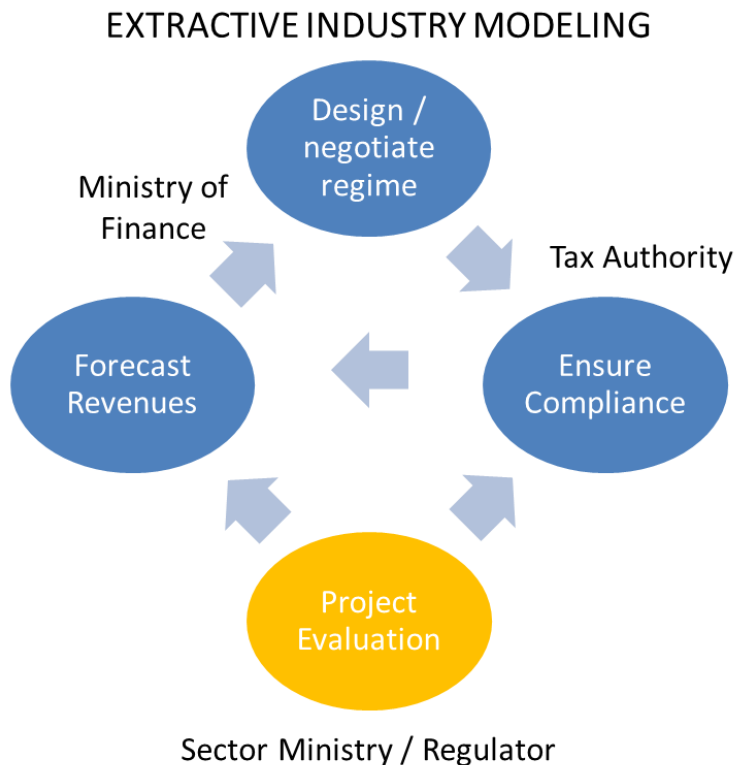
Ruby mine model focus

- Similar model structure, but different issues
- Ruby sales and valuation
- Management / marketing fees
- International transactions
- Fiscal regime interpretation / policy
 - Royalty rates and determination of base
 - What would government take be under new fiscal regime including resource rent tax?

Tax return reconciliation tool for Sierra Leone Revenue Authority



Linkage With Other EI Modeling Across Government



FEEDBACK TO POLICY

- Fiscal regime interpretation issues
 - Rulings? Regulations? Change the law?
- Quantify impact of fiscal regime concessions / tax expenditures
 - Tax holidays; accelerated depreciation; etc.

INPUT TO REVENUE FORECASTING

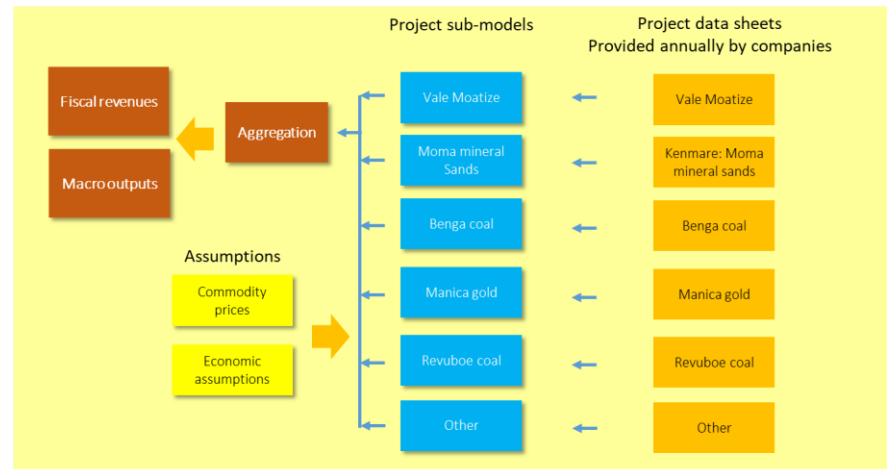
- Models reconciled to actual collections & tax returns: “back-casting”
- Use to improve *forecasting*

INPUT INTO PROJECT EVALUATION

- Ensure tax issues identified and addressed early

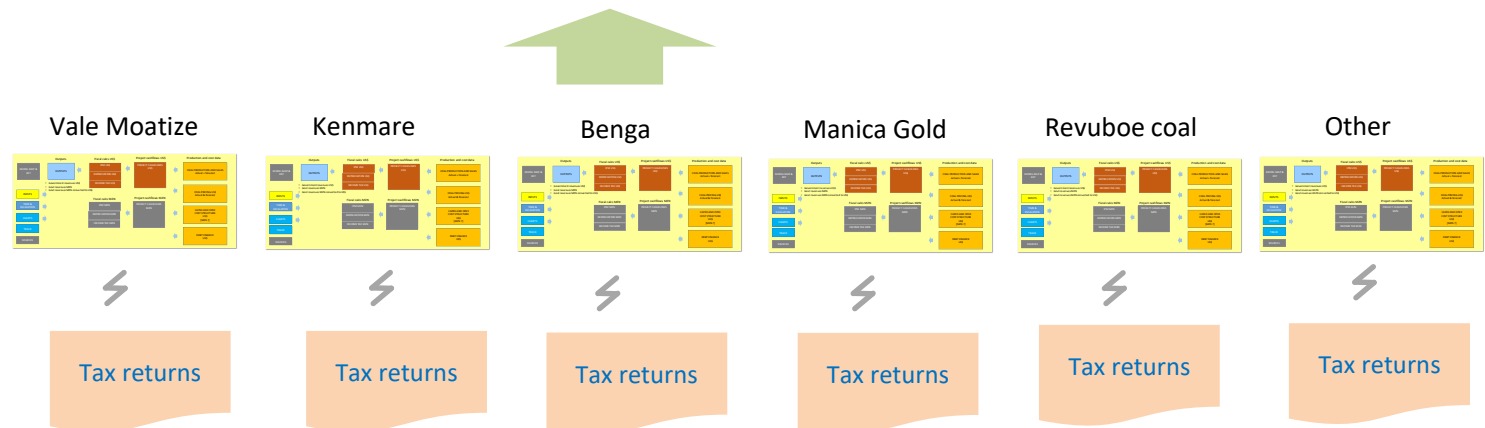
Link between Fiscal Risk Analysis and Revenue Forecasting Models: Mozambique

Ministry of Finance:
Aggregated sector
modeling



Tax Authority:
separate detailed
models for each
project

Models reconciled
to tax returns



Interaction with sector ministry / regulator modeling also needs to be considered

Revenue Forecasting Versus Fiscal Risk Assessment Models

- Greater level of detail required for fiscal risk modeling and reconciliation to tax returns
- Individual project models
- Focus on reconciling the past - this then informs assumptions for forecasting the future

Contrasting level of detail for revenue forecasting versus fiscal risk analysis modeling

| | Revenue forecasting model | | Risk analysis model | |
|------------------|-------------------------------|------------|--|-----------|
| Production/sales | Sales iron ore | DMT | Sales iron ore | WMT |
| | | | Sales iron ore | DMT |
| | | | Key impurities impacting price | % by elem |
| Mineral prices | Benchmark price | \$ / tonne | Benchmark price | \$ / DMT |
| | Transport cost | \$ / tonne | Transport cost | \$ / WMT |
| | Other Differentials | % | Commission | \$/t or % |
| | Realized price FOB | \$ / DMT | Quality difference 1 | calc |
| | | | Quality difference 2 | calc |
| | | | Other differences | % or \$ |
| | | | Realized price FOB | \$ / DMT |
| Cost structure | <u>Costs by activity</u> | | <u>Costs by activity</u> | |
| | Exploration | \$ mn | Exploration category 1 | \$ 000 |
| | Development | \$ mn | Exploration category 2 | \$ 000 |
| | Sustaining capital | \$ mn | Exploration category 3 | \$ 000 |
| | Operating costs | \$ mn | Exploration category 4 | \$ 000 |
| | Decommissioning costs | \$ mn | Development cost category 1 | \$ 000 |
| | | | Development cost category 2 | \$ 000 |
| | | | Development cost category 3 | \$ 000 |
| | | | Development cost category 4 | \$ 000 |
| | | | Operating cost category 1 | \$ 000 |
| | | | Operating cost category 2 | \$ 000 |
| | | | Operating cost category 3 | \$ 000 |
| | | | Operating cost category 4 | \$ 000 |
| | | | Operating cost category 5 | \$ 000 |
| | | | Total costs | \$ xxxx |
| | | | <u>Cost by cost type</u> | |
| | | | Labour | \$ 000 |
| | | | Fuel | \$ 000 |
| | | | Non-resident Contractors | \$ 000 |
| | | | Resident contractors | \$ 000 |
| | | | Contract mining | \$ 000 |
| | | | etc. | \$ 000 |
| | | | Total costs | \$ xxxx |
| Financing | <u>Single aggregated loan</u> | | <u>Breakdown for each finance facility</u> | |
| | Drawdowns | \$ mn | Drawdowns | \$ 000 |
| | Repayments | \$ mn | Repayments | \$ 000 |
| | Interest | \$ mn | Interest | \$ 000 |
| | Fees | \$ mn | Fees | \$ 000 |

Fiscal Risk Assessment Modeling Process

- ✓ Start simple & evolve as data and capacity permits
- ✓ Decide project priorities: start with big \$ projects or smaller projects as a learning experience?
- ✓ First step: summarize tax returns in excel
- ✓ Focus on establishing robust & repeatable data collection mechanisms
 - Close collaboration with sector ministry / regulator
- ✓ Models should follow common standard but tailored to each specific project & fiscal regime. Ideally a standardized approach to modeling across government.
- ✓ Reconciliation to actuals
 - Royalty returns; tax returns; production sharing returns
 - Reconciling tax returns to other data reported to sector ministry / regulator. This should be routine but is often not done at all ...

Ultimately the *process* matters more than the *spreadsheet* ...

Challenges

- Understanding of projects and fiscal regimes
- Data!
- Inter-institutional coordination and data sharing
- Record keeping in tax authority and other institutions
 - IT systems; spreadsheets; paper files
- Excel & modeling skills
- Tax Authority incentives: focus on short-term revenues at the expense of long-term?
 - Should Tax authority do a payroll audit for \$100,000 one-off adjustment versus a mineral transfer pricing audit worth \$100,000,000 over the project life?
- Lack of compliance activities pre-production (cost verification)

Risk Assessment Remains Relevant Across The Entire Project Life-cycle

- ✓ At the Feasibility study stage: to identify fiscal regime interpretation issues and high risk transactions.
 - ✓ Government retains higher leverage prior to project approval
- ✓ During development: planning cost verification activities; revising revenue forecasts as actual development costs incurred
- ✓ During production period: verifying past tax returns; planning future compliance activities
- ✓ At project Termination: settling final tax liabilities

QUESTIONS ?