

Valuation of Mining Projects

An Application for feasibility study and acquisition projects

Course outline

Current market turbulence has increased the need to understand the interrelationship between technical and financial risk. The key consideration is the intrinsic value of a mineral project. Many people in the mining industry are concerned that their organizations may be destroying value by making systematic errors in investment evaluation and decision. Where current market conditions undervalue the true long-term worth of assets, which is then reflected in low share prices, strategic planning can identify opportunities.

Understanding how this impact on the valuation of projects also permits an objective approach to determining levels of uncertainty. Therefore, it is very important to identify the uncertain variables and explore ways to minimize the downside risk and to maximize the upside potential. The advance analysis using probabilistic model and Real Options method is essential to understand the influences and dynamics of project economics with respect to the mining industry becoming imperative for anyone undertaking the new project investment.

This specially online three day course aims to provide a solid understanding how to evaluate of mining projects using VALMIN guideline and to improve the mining risk evaluation using probabilistic model and modern valuation method.

Course objective

This course will :

- Learn the basic of evaluation techniques as well as the practical the implementation of these techniques to mining projects based on the standard VALMIN code
- Enable participants to identify and quantifying risk using probabilistic Monte Carlo Simulation
- Bring participants up to date on recent development in project modeling and evaluation using advance valuation techniques.

Key Benefit

At the end of the course participants will:

- Have acquired the knowledge of best practice of investment strategy in mining project include acquisition
- Have acquired the skills to identify, model and evaluate a project using deterministic and probabilistic approach

Who should attend this course

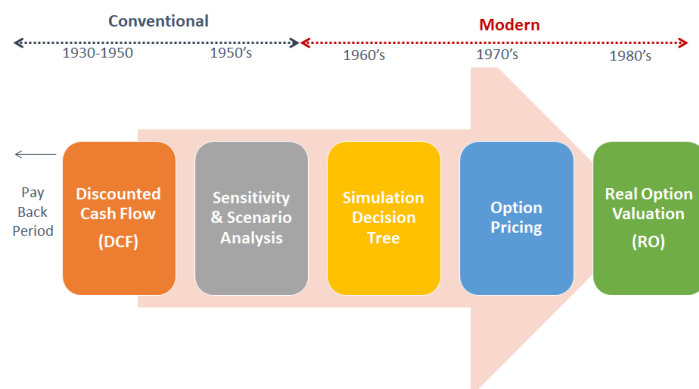
This three day course is designed for professional or investor who wants to learn investment evaluation in mining project and to improve their skills in evaluating techniques including risk quantification.

Delivery Format

This course is conducted as 3 x 2-hour sessions on three consecutive days. At the end of each topic, a 10 minute question-answer session is held where the instructor gives individual assistance.

During the course live, instructor will show how to apply each topic by simulating in excel. Participants will follow this simulation by comparing with the final result.

The Development of Valuation Techniques



Course facilitator

NUZULUL HAQ

Education:

- S1: Mining Metallurgy - ITB (1996)
- S2: Financial Management – UI (2002)

Work Experience:

- Metallurgist in Newmont Mesel (1997-1999)
- Process Engineer in Newcrest Gosowong (1999-2000)
- Planning and Economics – Medco Energi (2002-2017)
- Independent Consultant (2018 – present)
- Founder of Decisive Value Consulting that specialize in advance project economics using modern valuation techniques for improved investment decision.
- Author for several books related to Modeling valuation risk decision in resource-based industry



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Moving from the deterministic static approach to probabilistic dynamic approach framework for improved investment decision making in mining projects

Day One – Conventional Valuation Analysis

1. Fundamental of Project Economics

- Characteristic of Mining project investment
- Concept of Mining Investment Analysis
- Key metrics of valuation (NPV, IRR, Payback)
- Evaluation vs Valuation

2. Best Practice of Valmin Code

- Overview of VALMIN 2015
- Market vs Technical value
- Valuation Approaches: Market, Cost and Income
- Valuation techniques according to project status:
 - Exploration stage: Resource Multiple, Multiple Exploration Expenditure, Geoscientific Factor
 - Development stage: Reserve multiple, DCF, Yadrstick multiple factors market

Workshop 1: Calculation example for each valuation techniques as accepted by VALMIN

Day Two - Conventional Risk Analysis

3. Mining Risk Analysis

- Overview of risk analysis in mining project
- Risk vs Uncertainty
- Three Stage of Risk Quantification:
 1. Scenario Analysis (base, high, and low case)
Workshop 2: Building scenario model – reserve and development scenario
 2. Sensitivity Analysis (spider diagram, data table)
Workshop 3: Building sensitivity model (spider and tornado chart) – variation of price, grade, tonnage and cost)
 3. Monte Carlo Simulation (probabilistic of occurrence, risk vs return)
 - Introduction of probabilistic risk analysis
 - Type of probability distribution (normal, log-normal, and triangular)

Day Two - Modern Risk Analysis (Probabilistic Model)

4. Introduction to SIPMath Software

- Key features of SIPMath Software
- Steps to run simulation using SIPMath

Workshop 4: How SIPmath works in excel model

5. Monte Carlo simulation using SIPmath tools

- Schematic process of Monte Carlo simulation
- Quantifying variable uncertainty in mining project using simulations techniques
- Assessing the effect of variable uncertainty on project's NPV
- Step by step how to use SIPmath software

Workshop 5: Building a simulation on mining economic model using SIPMath tools

Day Three - Modern Valuation Techniques

6. Introduction to Real Options

- Birth and intuition behind Real Options
- Conventional DCF vs Real Options (RO)
Workshop 6: Building valuation model - DCF vs RO

7. The Use of Market information

- Futures market
- Forward Pricing model
Workshop 7: Develop dynamic stochastic price model integrated to Dynamic valuation model

8. Implementing Valuation framework on Acquisition project

- Price vs Value
- Concept of Bid level
Workshop 8: Determine the bidding price

Course material

1. Extensive course notes and excel spreadsheets
2. Free SIPmath Monte Carlo simulation software
3. Free book “ modelling valuation decision risk in Mining project “ by Nuzulul Haq (max 30 ex)

