DMT Kai Batla (Pty) Ltd

Advancing Mineral Asset Valuation

Johannesburg

October 2025

Agenda

Topics for Discussion

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1. The Prospector's Fantasy
2. Uses of Mineral Asset Valuation
3. Traditional Valuation Approaches
4. Integrating Valuation Techniques
5. The Evolving Landscape of Asset Valuation
6. Limitations of Deterministic Models
7. Transitioning to Probabilistic Valuation
8. Benefits of Probabilistic Modelling
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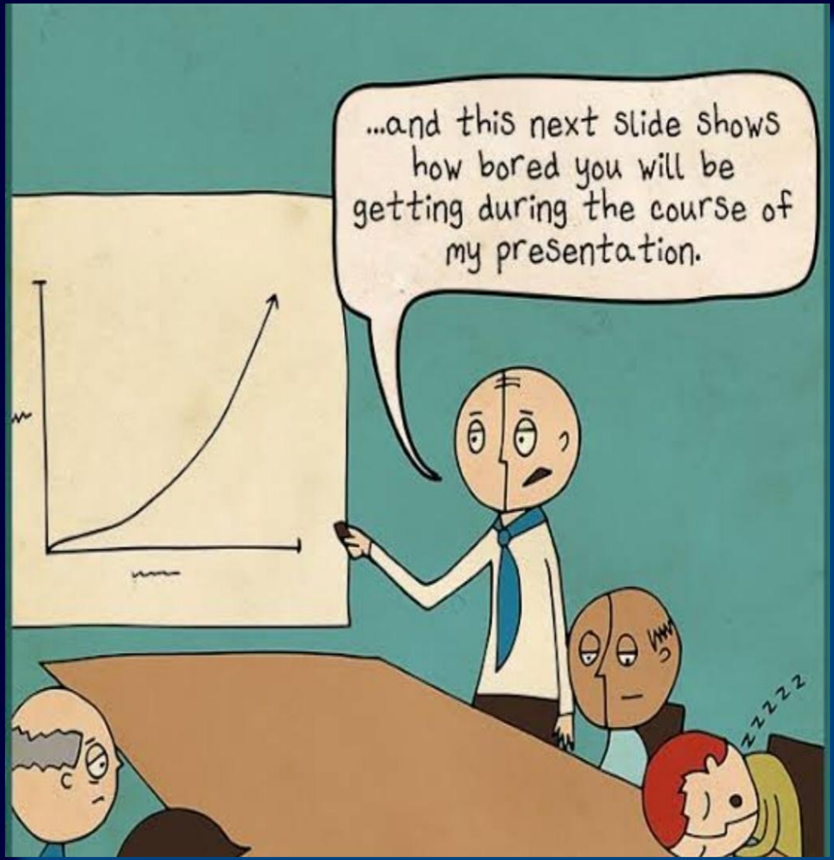
10. Converting Uncertainty into Insights
11. Stochastic Valuation Models
12. Risk Quantification in Asset Valuation
13. Quantifying Financial Risk
14. Integrating Valuation Methodologies
15. Credit and Funding Support
16. Future Valuation and Data Analytics
17. Implications for Mining
18. Governance, Compliance and Ethics



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The Prospector's Fantasy

Every explored deposit is just a few drill holes away from exceptional value that screams : "Retire Early!".

Yet, for every winner, there's a graveyard of holes where similar dreams expire dearly.

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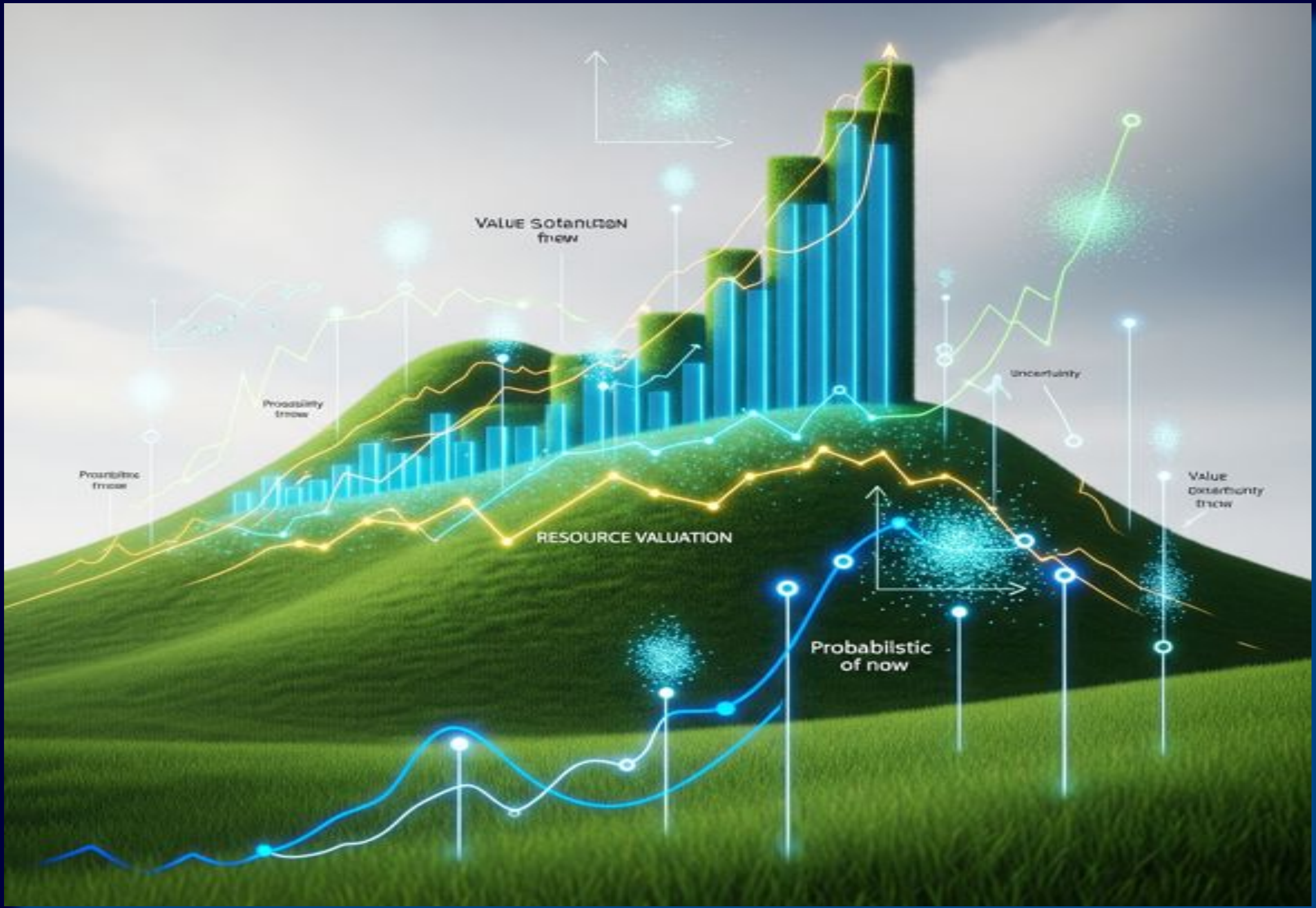

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Uses of Mineral Asset Valuation

Valuation is used in investment decision making, project financing, mergers and acquisitions, regulatory reporting, taxation and dispute resolution.

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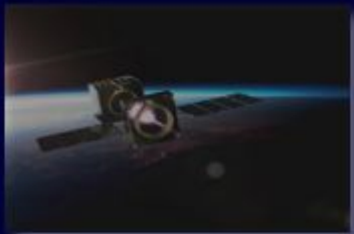

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1. Mergers and Acquisitions: Determining the fair value of an asset before a transaction.
2. Investment Decision Making: Assessing the attractiveness of potential investments.
3. Financial Reporting: Accounting standards for impairments and fair value reporting.
4. Taxation and Transfer Pricing: Fair value for tax reporting and intercompany transactions.
5. Project Finance and Funding: Loan applications, debt structuring and capital raising.
6. Litigation and Dispute Resolution: Used in value disputes and shareholder disagreements.
7. Regulatory Compliance: Securities commissions, exchanges or government authorities.
8. Strategic Planning and Business Growth: Expansion opportunities or restructuring.
9. Insurance and Risk Management: Determining value for coverage and claims settlement.
10. IPO and Public Listings: Establishing a fair valuation for IPOs or share issuances.
11. Bankruptcy and Restructuring: Assessing asset values during insolvency proceedings.
12. Royalty and Licensing Agreements: Valuing intellectual property, trademarks or royalties.
13. Privatisation and Government Transactions: Valuing state owned enterprises.
14. ESG Assessments: Quantifying economic and sustainability factors in large projects.

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Traditional Valuation Approaches in Mining

The cost, market and income approaches have traditionally formed the foundation of mineral asset valuation, shaping practices across generations in the mining industry.

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Cost Approach:

- Suitable for early stage exploration
- Used when market and income data are limited
- Relies on the accuracy of historical costs
- Simple to apply and easy to understand
- Provides a transparent basis for valuation
- Ignores future earning potential of the asset
- Can undervalue deposits with strong upside or long mine life
- Sunk costs mistaken for economic value

Market Approach:

- Recent comparable transactions available
- Suitable for operating mines and projects
- Reflects actual market sentiment and investor appetite
- Anchored in observable market prices
- Scarcity of data
- Adjust for differences in geology, jurisdiction
- Sensitive to short term commodity cycles and market volatility
- Risk of using misleading benchmarks

Income Approach:

- Used when reliable forecasts exist
- Operating mines
- Time value of money and earnings potential
- Requires detailed, defensible technical & financial assumptions
- Complex and resource intensive to build and validate
- Allows scenario and sensitivity testing
- Highly sensitive to discount rate, price, and cost inputs
- Risk of bias or error

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Integrating Advanced Valuation Techniques

While traditional approaches will remain the bedrock of asset valuation, their resilience will be reinforced when combined with more advanced risk adjusted techniques.

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- Probabilistic Modelling
- Statistical Techniques
- Real Options Valuation
- Binomial Tree Analysis
- Decision Rules
- Risk Adjusted DCF Analysis
- Portfolio Optimisation Models
- Multi-variable Linear Programming
- AI Driven Predictive Engines
- Machine Learning Algorithms
- Cloud Based Processing
- Incorporation of Big Data

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The Evolving Landscape of Mineral Asset Valuation

Valuation should therefore evolve such that its established strengths are leveraged and its transformation is accelerated to remain credible in a changing industry.

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Current Strengths

- Longstanding frameworks such as cost, market and income approaches
- Global recognition and acceptance by investors and regulators
- Structured frameworks, standards, guidelines and procedures
- Strong technical foundations in financial modelling and discounted cash flow
- Comparability across assets, commodities and jurisdictions

Limitations

- Over reliance on deterministic methods
- Limited incorporation of probabilistic techniques and range analysis
- Inconsistent treatment of qualitative factors and non-financial risks
- Data quality issues and information gaps in early stage projects
- Fragmented approaches across jurisdictions, industries and commodities

The Evolution:

- Integration of probabilistic and more advanced techniques
- Use of AI, machine learning and cloud computing platforms
- Embedding real options to capture managerial flexibility
- Incorporating qualitative factors, societal concerns and climate transition risks
- Enhancing transparency and communication of risk adjusted results

And Why?

- Loss of credibility with investors, lenders, regulators and other stakeholders
- Misallocation of capital due to false precision in models
- Inability to accurately price uncertainty and strategic optionality
- Competitive disadvantage against industries adopting advanced analytics
- Risk of regulatory or market rejection of outdated valuation methods

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Limitations of Deterministic Models

Deterministic models provide concise, single point discrete estimates but they fail to capture the uncertainty, variability and inherent risk in mineral assets.

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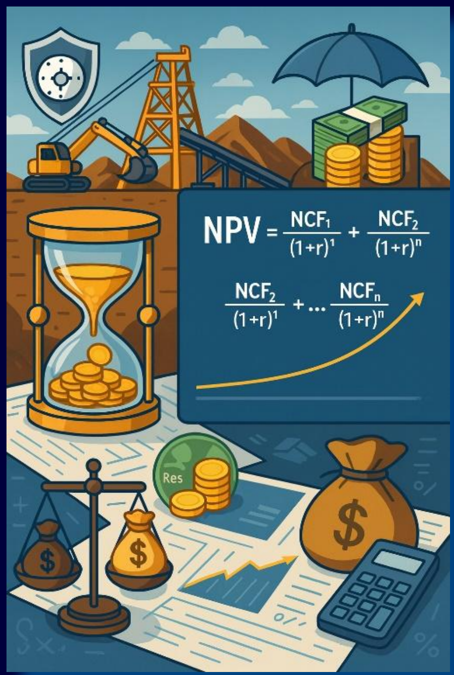

- Single point bias hides dispersion and creates false precision
- Volatility exposure rapidly erodes deterministic outcomes
- Lack of flexibility and option value limits decision agility
- Implicit uncertainty amplifies valuation confidence
- Deterministic outcomes mask upside and downside risk
- Single point valuation estimates pose strategic blindness
- Discrete outputs and over precision undermine project credibility

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Transitioning To Probabilistic Valuation Models

By moving beyond a discrete estimate to a probabilistic range, valuation is transformed into a tool that inherently incorporates uncertainty, risk and variability.

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- Introduce and encourage stochastic modelling platforms and management buy-in.
- Assign appropriate probability density functions to key modelling variables.
- Use historical data, market activity, analogous estimation and expert judgement.
- Develop frameworks to capture structured and random uncertainties.
- Recognise the value of managerial options such as expansions or deferrals.
- Leverage AI and utilise cloud based computing systems.
- Build inhouse capacity and inter-disciplinary collaboration.
- Institutionalise governance and modelling oversight.

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Benefits of Probabilistic Modelling

Static assumptions are morphed into range-based inputs underpinned by statistical rigour that balances project risk and project reward with greater clarity and confidence.

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Captures the full range of uncertainty
- Reflects the full range of possible outcomes.
- Visibility of both upside and downside risks.

Improves the quality of decision making
- Supports more informed capital allocation.
- Evaluates trade-offs between risk and return.

Enhances project and valuation credibility
- Outputs aligned with real world variability
- Trust in valuations with explicit risk ranges.

Accounts for strategic option value
- Deferrals or expansions can be quantified.
- Flexibility with financial decision making.

Guides risk adjusted project returns
- Adjusts for probability weighted risk.
- Assesses risk premiums more transparently.

Encourages validation and transparency
- Assumptions highlight sources of uncertainty.
- Models invite scrutiny and collaboration.

Valuation and Schrödinger's Cat Analogy

An asset's true value remains in an indeterminate state, suspended between multiple outcomes, until the moment of sale (the observation), crystallizes the asset's value.

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- Value is in a state of superposition until a sale collapses the valuation range into a tangible price.
- Measurement alters the outcome. Due diligence studies and risk assessments act as measurements that shape valuation expectation.
- Uncertainty is inherent and is not an error. Therefore, uncertainty must be quantified since it cannot be fully eliminated.
- Timing alters the outcome. Various periodic disclosures have a fundamental impact on value.
- Value is relative to the observer, so perceived valuation will be different to different stakeholders.

Converting Uncertainty Into Measurable Insights

Value is not absolute but emerges through observation where a different version of the truth evolves by transforming incomplete information into probability weighted insights.

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Asset valuation is hamstrung by inadequate information, behavioural bias and external volatility.

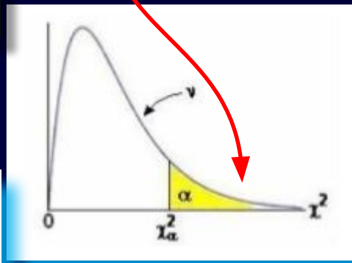
$$\frac{\bar{X} - \mu_0}{\sigma_0 / \sqrt{n}} = Z$$

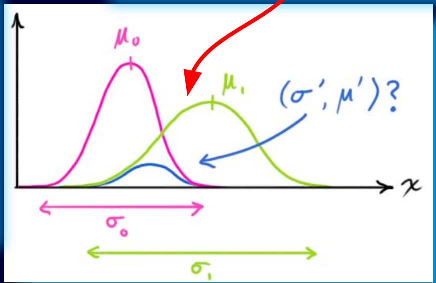
What is the quality of the assumptions?

Which statistical distribution does one use?

I'm trying to think, don't confuse me with facts.

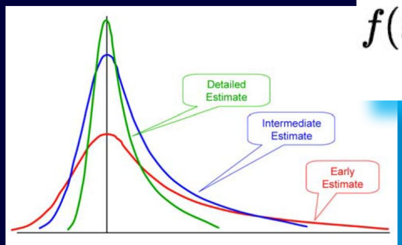
— Plato —





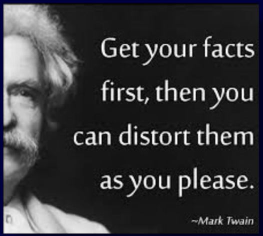
Which analytical solution to deploy?

$$\frac{2}{\omega\sqrt{2\pi}} e^{-\frac{(x-\xi)^2}{2\omega^2}} \int_{-\infty}^{\alpha\left(\frac{x-\xi}{\omega}\right)} \frac{1}{\sqrt{2\pi}} e^{-\frac{t^2}{2}}\, dt$$



$$f(x) = \begin{cases} \frac{k}{\lambda}\left(\frac{x}{\lambda}\right)^{k-1} e^{-(x/\lambda)^k} & x \geq 0 \\ 0 & x < 0 \end{cases}$$

How do you parameterise the distribution?



Parameters evolve over time!

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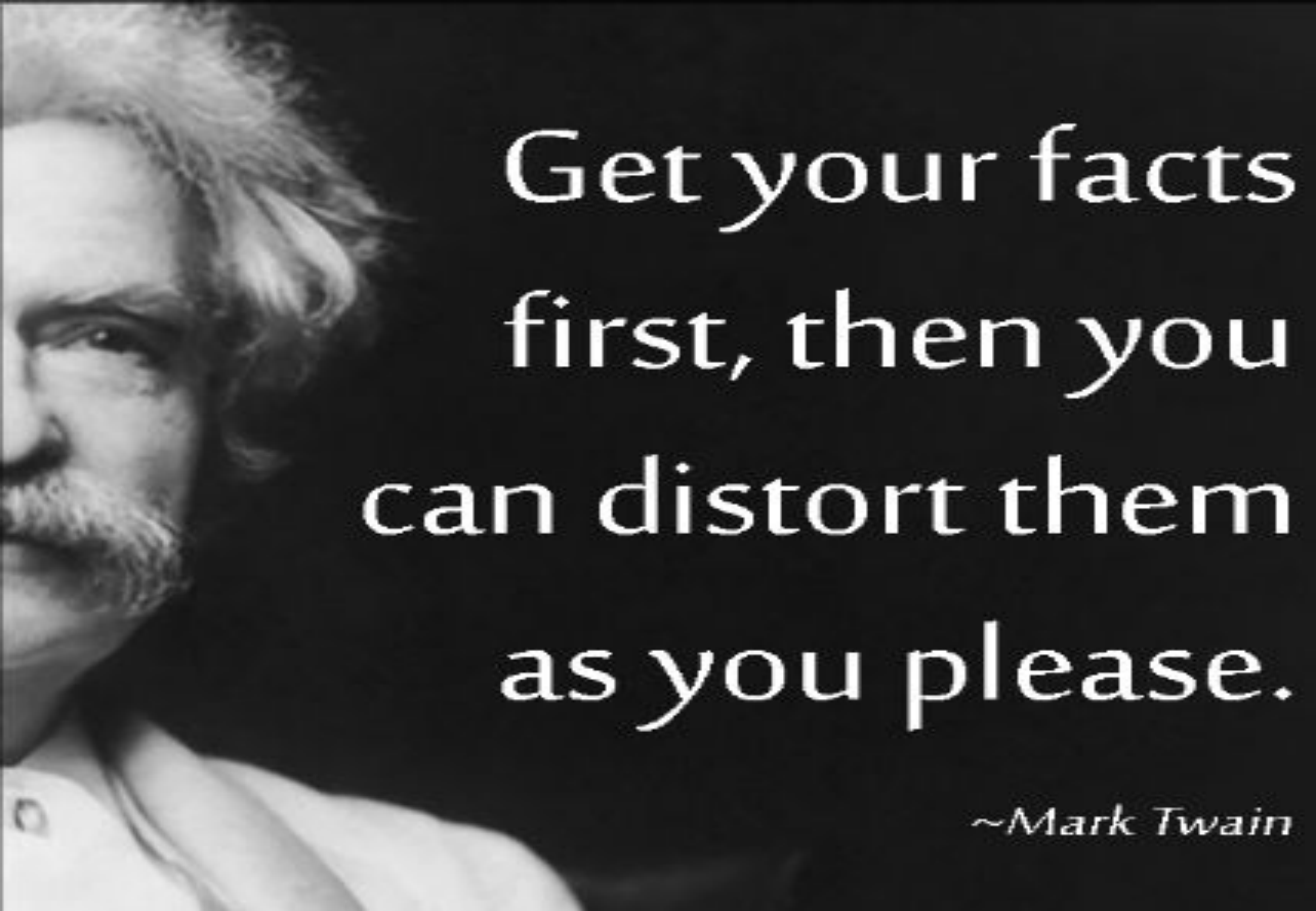
Get your facts
first, then you
can distort them
as you please.
~Mark Twain

Stochastic Asset Valuation Models

Valuation is simply a consequence that flows from a model premised on validated inputs and qualified uncertainties processed through structured quantification.

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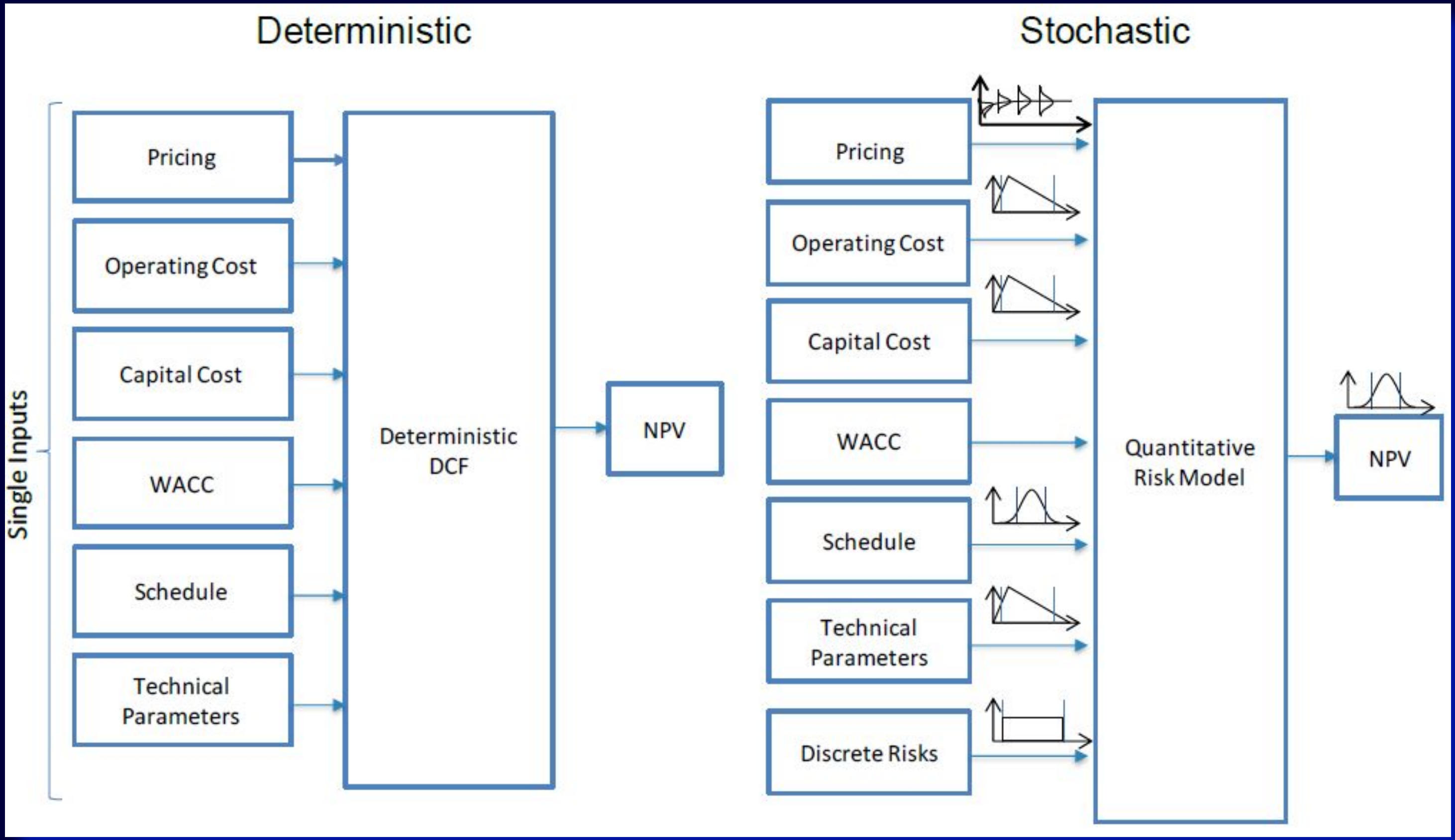

Source: Stochastic Modelling in Mine Valuation, SMME

Validating Technical Inputs

Validating the technical assumptions is central to valuation as it ensures that the economic outcomes are grounded in reliable geological, mining and processing realities.

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Technical Variables

Resources and Reserves

- Defines the primary mineral assets available for extraction.
- Direct impact on potential revenue and valuation of the mining company.
- Validation through independent assessments
- Forms the basis for future cash flow projections and project feasibility.

Construction Schedule

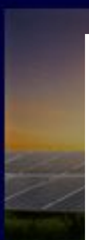
- Outlines the timeline to bring the project to operational status.
- Affects the timing of cash inflows and project NPV significantly.
- Delays can increase costs and reduce the overall project value.
- Validate through detailed project management.

Mined Tonnage

- Represents the amount of ore that will be extracted each year.
- Directly affects the scale of production and associated revenues.
- Variability in tonnage can lead to inconsistent production and revenues.
- Validated through geological models.

Reserve Grade

- Indicates the concentration of valuable minerals within the ore body.
- High grade ore typically results in higher revenues.
- Lower grades require more processing, increasing costs.
- Validate with detailed sampling and testing.

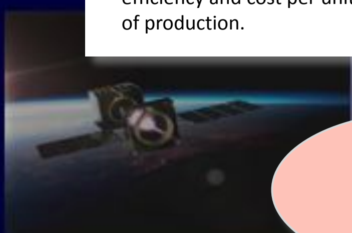


Availability and Utilisation

- Reflects actual operating hours vs total scheduled time
- Directly impacts production rates and output forecasts
- Influences equipment sizing and redundancy requirements
- Key driver of operating efficiency and cost per unit of production.

Metal Recovery

- Percentage of the mineral content extracted from ore during processing.
- High recovery rates increase revenue potential and project efficiency.
- Validated through pilot plant tests and metallurgical studies.
- Essential for realistic cash flows.



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Equipment Capacity

- Aligned with planned mining and processing throughput rates
- Determines haulage, crushing and milling constraints
- Impacts maintenance schedules and operating availability
- Drives capital and replacement cost.

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Overlaying Economic Variables

Similarly, the economic assumptions anchor the valuation projections in credible market, cost and pricing environments that reflect economic reality.

Economic Variables

Metal Price Forecasts

- Represents the market price at which the mined product is sold.
- Directly impacts revenue generation.
- Price volatility can significantly affect cash flow and project viability.
- Validate with historical price analysis and expert forecasts.

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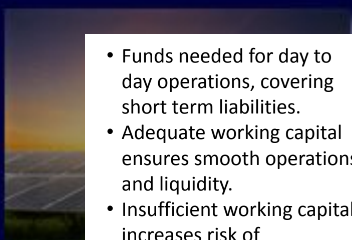
Fixed Costs

- High fixed costs reduce flexibility, impacting breakeven and profitability.
- Financial risk increases if fixed costs are high relative to revenue.
- Validation through benchmarking with similar projects and industry data.

Variable Costs

- Variable costs directly tied to production activities.
- Significant impact on profitability and cash flow.
- Higher variable costs decrease margins and project feasibility.
- Validation through detailed cost estimation and historical data.

Working and Sustaining Capital

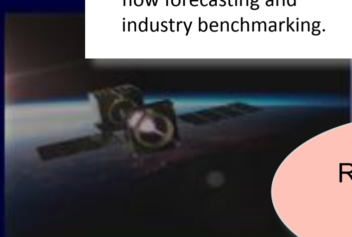


- Funds needed for day to day operations, covering short term liabilities.
- Adequate working capital ensures smooth operations and liquidity.
- Insufficient working capital increases risk of operational disruptions.
- Validated through cash flow forecasting and industry benchmarking.

Inflation and Exchange Rates

- Reduces the purchasing power and real value of future cash flows.
- Impacts costs, requiring adjustments for realistic financial forecasts.
- Higher inflation increases operating expenses and capital costs.
- inflation forecasts and sensitivity analysis.

Royalties and Taxes



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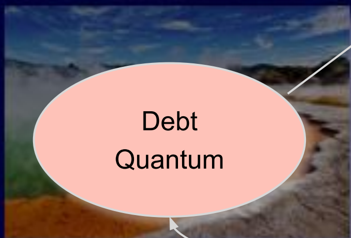
- Government levies that reduce net profit and affect cash flows.
- Higher taxes decrease project NPV and overall profitability.
- Tax policies and changes add risk and affect after tax returns.
- Validation through expert tax planning.

Capital Budget

- Directly affects the project's valuation and financial feasibility.
- High capital costs increase financial burden and project risk.
- Validation through feasibility studies and cost benchmarking.
- Influences return metrics like ROI and payback.

Funding and Risk Variables

Additionally, these parameters define the capital structure, financing and exposure to uncertainty which directly shapes the asset's resilience and attractiveness to investors.



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Risk Variables

Debt Quantum

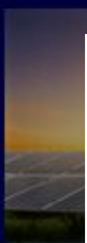
- Impacts financial flexibility and cash flow requirements for repayments.
- Higher debt quantum increases financial risk due to fixed obligations.
- Validation through debt servicing analysis and cash flow projections.

Lending Rates

- Higher rates increase debt costs, reducing project cash flow and NPV.
- Significant for calculating the cost of capital and project feasibility.
- Validated by checking market rates and lender terms.
- Key input for calculating interest expense.

Grace Periods

- Time before debt repayments begin, allowing revenue buildup.
- Reduces initial cash flow pressure, positively impacting liquidity.
- Validation through cash flow projections and lender agreement details.
- Important for managing cash flow.

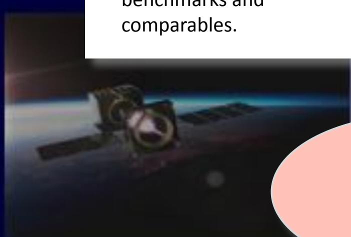


Industry Beta

- Measures the volatility of returns compared to the overall market.
- Higher beta increases cost of equity.
- Essential in CAPM to determine required returns for investors.
- Validate by selecting appropriate industry benchmarks and comparables.

Loan Tenor and Payment Period

- Longer periods reduce annual payments, easing cash flow demands.
- Shorter periods increase risk of cash shortfalls, especially in low revenue.
- Validation through debt amortization schedules and cash flow modelling.
- Critical for aligning debt with revenue cycle.



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Sovereign Risk

- Country specific risk factors, including political and economic stability.
- High sovereign risk reduces project NPV due to increased discount rate.
- Directly impacts investment attractiveness and financing costs.
- Validation through country risk assessments.

Market Risk Premiums

- Additional return expected by investors to compensate for market risk.
- Higher risk premiums increase cost of equity, impacting WACC and NPV.
- Significant for determining investor returns in volatile markets.
- Research validation.

Risk Quantification in Mineral Asset Valuation

Mineral asset valuation demands a disciplined approach to risk quantification and risk management that identifies, measures and transforms risk into irreducible uncertainty.

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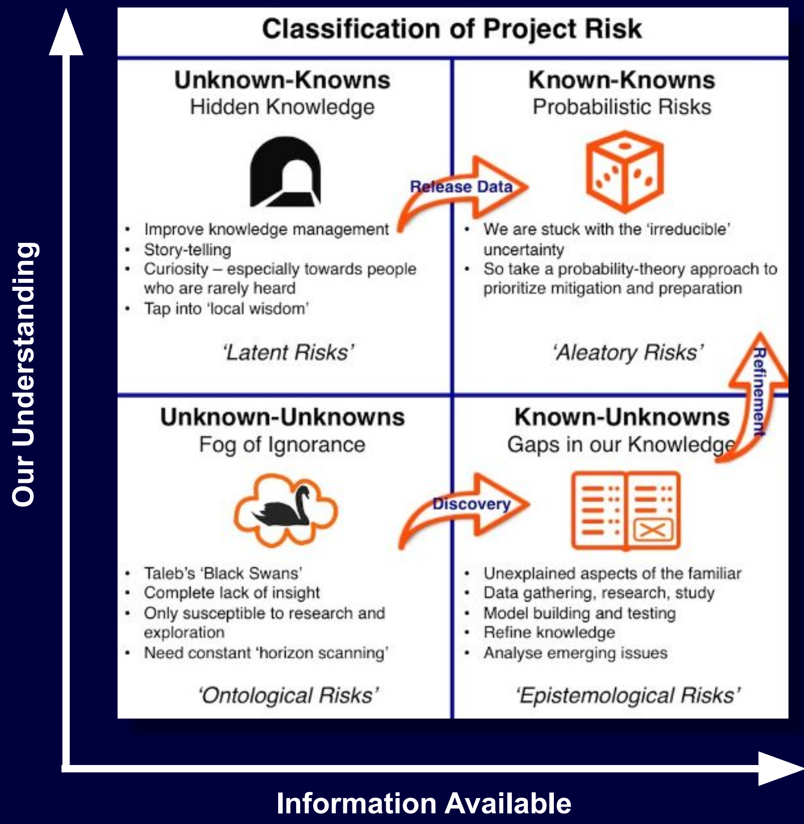

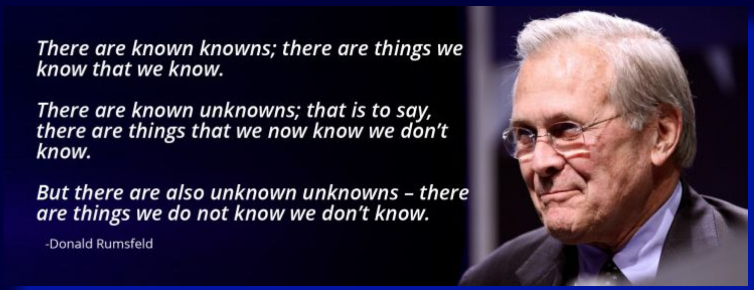

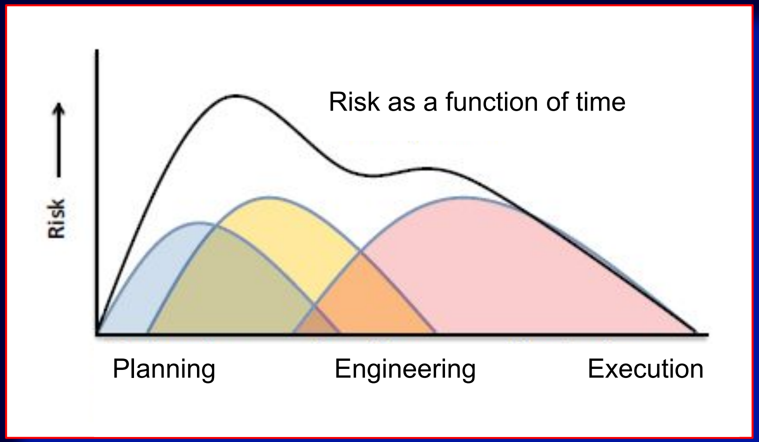

Source: Project Finance Execution Strategy, Socar Polymer

Matrix Categorisation of Risks

Valuation requires transcending traditional risk tables that simply rank frequency and impact to categorising risks in a way that captures the full spectrum of uncertainty.

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Increasing Understanding/Higher Certainty

Unknown Knowns

- Hidden Facts or Information
- Untapped Knowledge
- Hidden Risks which could emerge
- Known Risks but Unknown Impact
- Qualitative in nature
- Reasonable Anticipation
- Implicit Assumptions
- Build Hypotheses
- Knowledge Discovery, Assumptions
- ***Latent Risks***

Known Knowns

- Risks we are certain about
- Accumulated Knowledge and Experience
- Inherent Variability/Randomness
- Irreducible Uncertainty
- Irresolvable Indeterminacy
- Probabilistic Techniques/Monte Carlo
- Included in Project Scope
- Requirements
- ***Aleatory Risks***

Unknown Unknowns

- Complete Ignorance
- Complete Lack of Insight
- Unfathomable Uncertainty
- Unprecedented Unfamiliarity
- No Clue Whatsoever
- Black Swan Events
- Research and Exploration
- Absolute Truths
- ***Ontological Risks***

Known Unknowns

- Classic or Known Risks
- Risks have been Identified
- Qualitative or Quantitative in nature
- Gaps in Knowledge
- Limited Understanding
- Unexplained aspects of the familiar
- Brain Storming
- Risk Register
- Questions to be asked
- ***Epistemological Risks***

Increasing Knowledge/Higher Identification

PHASES OF PROJECT RISK

Project risks evolve along the development curve, with distinct exposures emerging during different stages, shaping the overall risk profile and the valuation approach.

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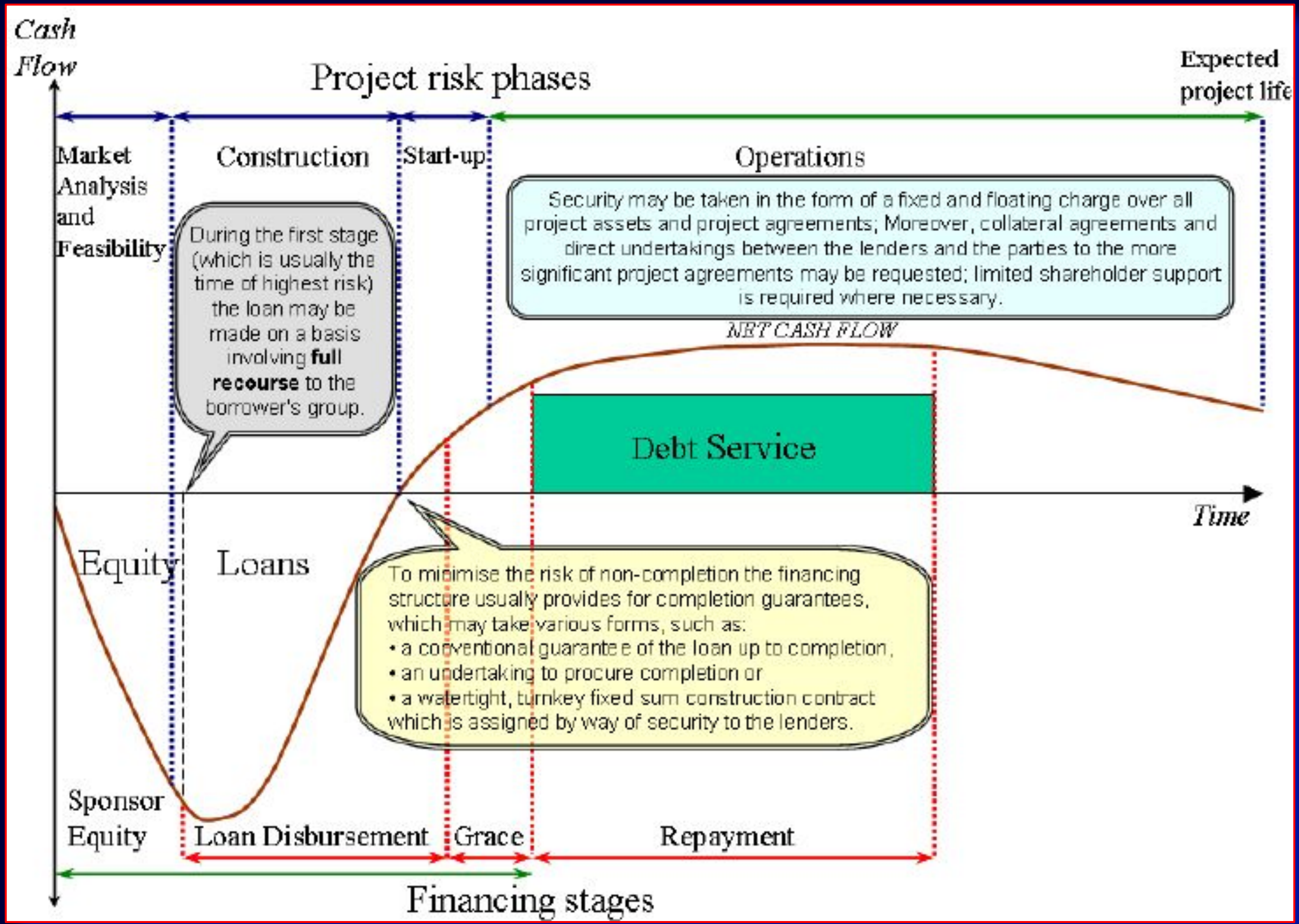

Source: Corporate Lending and Assessment of Credit Risk, Queens University

Modelling Revenues and Costs

Applying spreads to revenue and costs is essential for capturing variability of cash flows, enabling a realistic assessment of financial outcomes.

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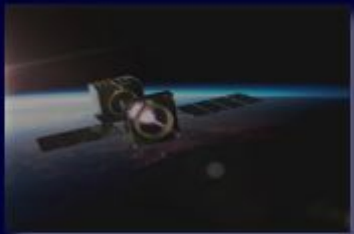

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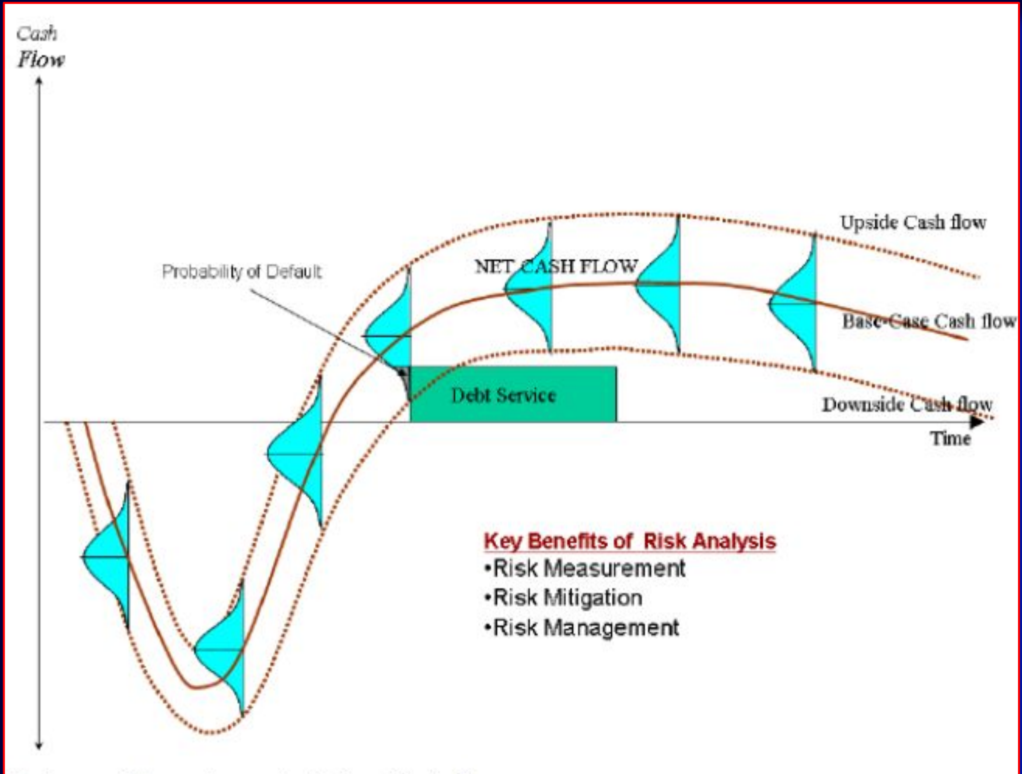

The Impact of Uncertainty on the Projected Cash Flow

Source: Corporate Lending and Assessment of Credit Risk, Queens University

- Exploration
- Start-Up
- Growth Phase
- Self-Funding
- Operating Leverage
- Capital Return
- Decline
- Closure
- Rehabilitation

Incorporating Probability Density Functions

PDFs are fundamental in valuation as they allow input variables to be represented as ranges rather than fixed inputs to order to generate probability weighted outcomes.

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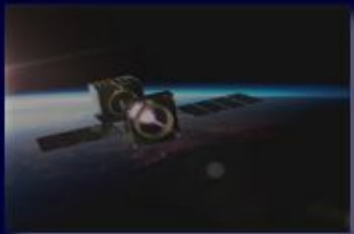

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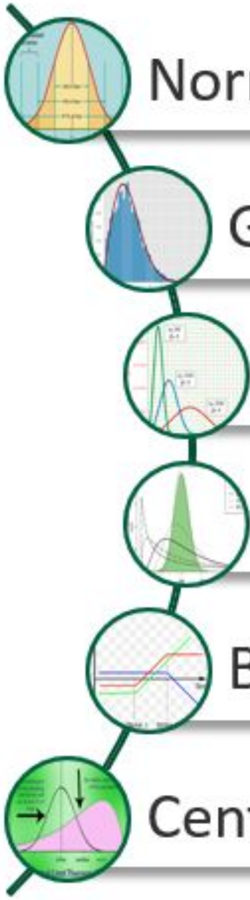

Normal Distribution

$$\varphi(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}x^2}$$

Gamma Distribution

$$f(x;\alpha,\beta) = \frac{1}{\Gamma(\alpha)\beta^\alpha} x^{\alpha-1} e^{-x/\beta}$$

Weibull Distribution

$$f(x;\lambda,k) = \begin{cases} \frac{k}{\lambda}\left(\frac{x}{\lambda}\right)^{k-1} e^{-(x/\lambda)^k} \\ 0 \end{cases}$$

Log-Normal Distribution

$$f(x;\mu,\sigma) = \frac{1}{x\sigma\sqrt{2\pi}} \exp\left(-\frac{(\ln x-\mu)^2}{2\sigma^2}\right)$$

Black Scholes Option Pricing

$$c = S_0\, N(d_1) - K\, e^{-rT} N(d_2)$$
$$p = K\, e^{-rT}\, N(-d_2) - S_0\, N(-d_1)$$
$$\text{where } d_1 = \frac{\ln(S_0/K) + (r+\sigma^2/2)T}{\sigma\sqrt{T}}$$
$$d_2 = \frac{\ln(S_0/K) + (r-\sigma^2/2)T}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T}$$

Central Limit Theorem

$$\lim_{N\to\infty} P_N(X) = \frac{1}{\sqrt{2\pi N}\sigma} \exp\left(-\frac{(X-N\mu)^2}{2N\sigma^2}\right)$$

ATTRIBUTORS OF RISK IN ASSET VALUATION

Evaluating risk requires a holistic approach that recognises every stakeholder's exposure to ensure that these risks are appropriately allocated and managed.

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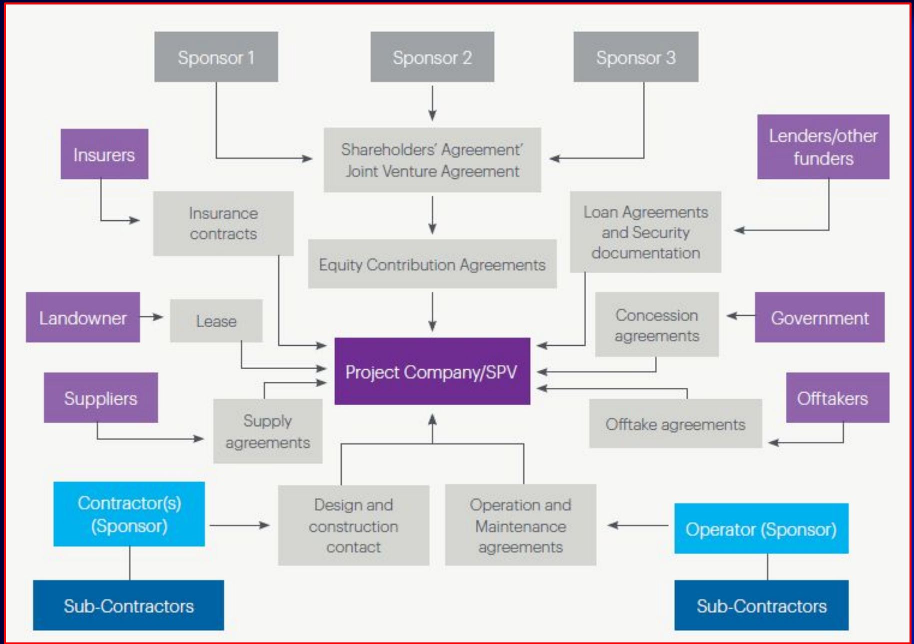

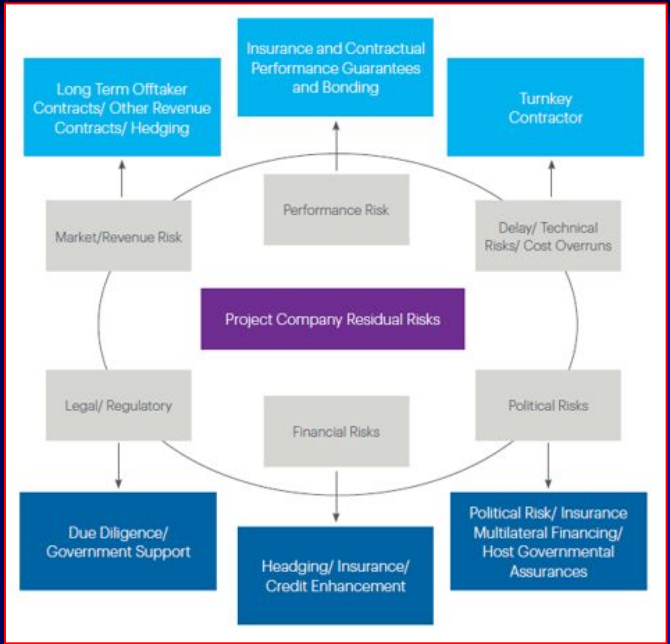

Source: Identifying and Allocating Risks in Project Financing, Dentons

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Capital Asset Pricing Model

CAPM explains how the expected return on an asset is determined by combining a baseline return with a premium that reflects market returns and sector correllation.

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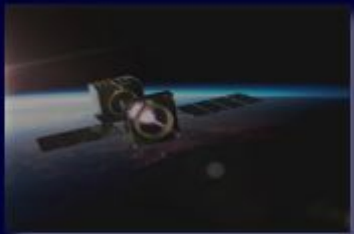

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$$R = R_f + \beta(R_m - R_f)$$

where:

$$R = \textit{Expected return on a security}$$

$$R_f = \textit{Risk free rate}$$

$$R_m = \textit{Expected return of the market}$$

$$\beta = \textit{Beta of the security}$$

- Estimating the Cost of Equity.
- Valuation and Investment Decisions.
- Portfolio Optimisation.
- Performance Benchmarking.
- Capital Budgeting.

CAPM VARIABLES

CAPM should be used for assets where systematic risk is the primary consideration and where the investment environment aligns with CAPM's assumptions.

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Definitions:

- Expected market return: This is the return expected from the overall market. This value is typically derived from historical data.
- Risk-free rate: The return of an investment with zero risk, often represented by government bonds.
- Market risk premium: The difference between the expected market return and the risk-free rate.
- Industry Beta: A measure of an asset's volatility compared to the market. It indicates how much an asset's return moves relative to market returns.
- Beta Values: A Beta of 1 means the asset moves with the market; >1 means more volatile, and <1 means less volatile than the market.

Hamada Formula

The Hamada formula adjusts a company's unlevered beta to account for financial leverage, showing the impact of debt on the company's equity risk.

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$$\beta_L = \beta_U \left[1 + (1 - T)\left(\frac{D}{E}\right)\right]$$

where:

$\beta_L =$ Levered beta

$\beta_U =$ Unlevered beta*

$T =$ Tax rate

$D/E =$ Debt to equity ratio*

- The Hamada formula expresses how debt increases the risk of equity, as higher leverage amplifies the equity holders' exposure to systematic risk.
- It adjusts unlevered beta to reflect the impact of financial leverage on equity risk, showing how debt influences the company's Beta.
- By increasing debt, a company's levered Beta rises, indicating higher risk for equity holders due to financial leverage.
- The Hamada equation helps calculate the cost of equity in the CAPM by accounting for both business and financial risks in firms with different capital structures.

Relevered Beta

When debt is added to the business, Beta needs to be relevered so that it captures both business risk from operations and additional financial risk from debt.

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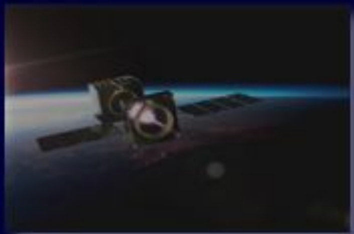

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- Impact of Leverage on Beta: As leverage increases (i.e., higher debt relative to equity), levered beta rises, reflecting greater risk for equity holders. This increased risk means that equity investors require a higher return as compensation for the added financial risk.

- Use in CAPM: Levered beta is used in the Capital Asset Pricing Model (CAPM) to calculate the cost of equity, providing a risk adjusted return that incorporates the effect of leverage. Higher levered beta results in a higher required return on equity, adjusting for the risk introduced by debt.

- De-Levering and Re-Levering: In valuation and comparisons across firms, analysts often de-lever beta to compare firms on a like-for-like basis (removing the impact of capital structure). They then re-lever it to the target firm's capital structure, adjusting for any unique financial risk.

Weighted Average Cost of Capital

The Weighted Average Cost of Capital (WACC) represents the average rate of return that a company must earn on its investments to satisfy its equity and debt holders.

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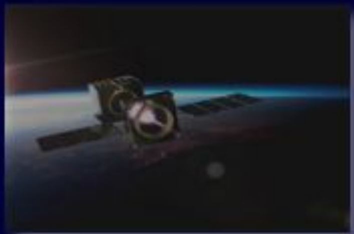

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$$WACC = \frac{E}{D+E}(r_e) + \frac{D}{D+E}(r_d)(1-t)$$

Where:

E = market value of equity

D = market value of debt

r_e = cost of equity

r_d = cost of debt

t = corporate tax rate

- WACC is a weighted blend of the costs of debt and equity, reflecting the proportions of each in the company's capital structure.
- WACC is particularly important in capital intensive industries like mining where funding sources and costs impact project feasibility, mineral asset valuation and investment decisions.
- It provides a unified, risk adjusted rate that considers both the cost of borrowing and the opportunity cost of equity.

Enterprise Value

Enterprise Value (EV) represents the present value of a company's future cash flows available to all capital providers, both debt and equity holders.

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$$EV = \sum_{i=1}^{n} \frac{FCFF_i}{(1+WACC)^i} + \frac{TV}{(1+WACC)^n}$$

$$TV = \frac{FCFF_{n+1}}{(WACC-g)} = \frac{FCFF_n \times (1+g)}{(WACC-g)}$$

- NPV calculates the present value of expected future cash flows, discounting them at a rate reflecting the asset’s risk (WACC).
- In the NPV calculation, future cash flows represent the expected income from the investment, typically forecasted over several years to capture its economic benefit.
- The terminal value estimates the project’s value beyond the forecast period, often calculated using the perpetuity growth method and is essential for long-term investments.
- NPV is derived by summing the discounted cash flows over the forecast period plus the discounted terminal value.

Integrating the Sciences

Asset valuation requires a unique look through various lenses across the sciences where each perspective adds a layer of insight that sharpens overall understanding.

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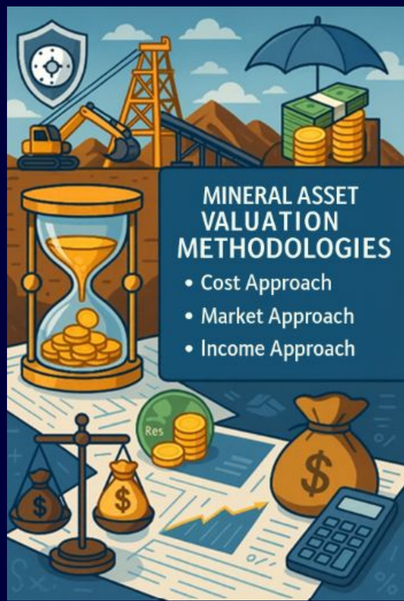

- Integrate the sciences (Maths, Stats, Eng, Finance, Economics)
- Adopt option pricing techniques to complement value
- Use a portfolio based approach to diversify risk
- Apply confidence levels to improve valuation credibility
- Substitute numerical models with analytical formulations
- Validation and calibration of models against empirical data
- Combine variable outcomes through the Central Limit Theorem

Combining Valuation Methods

The choice of valuation method depends on the asset's development, the quality of information available, the time horizon and the complexity needed to account for risk.

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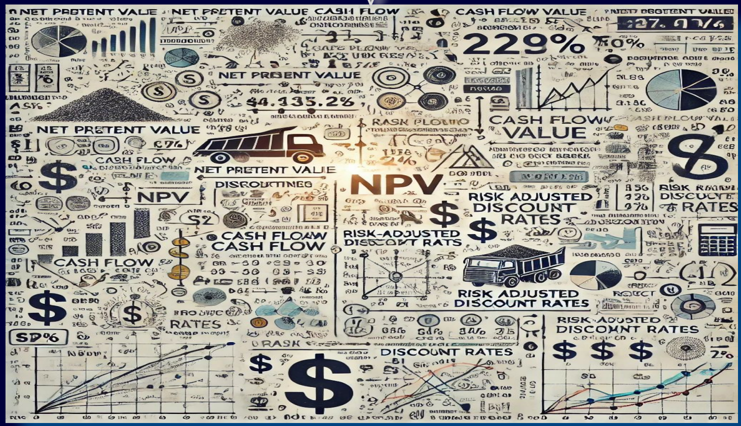
- Historical Estimates
- Engineering Approximations
- Expert Judgement
- Group Decision Making
- Parametric Estimates
- Analogous Estimation
- Throughput Ratios
- Resource and Reserve Analysis
- Bottom-up Estimation
- 3-Point Estimation
- Cost Approach
- Discounted Cash Flow Analysis
- Comparable Company Analysis
- Recent Transaction History
- Balance Sheet/Book Value
- Market Capitalisation
- Earnings Multiple Methods
- PNAV Estimates
- Probabilistic Techniques
- Real Options



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Structured Valuation Methodology

A disciplined valuation process relies on clearly defined steps that integrate technical, financial and risk elements to generate consistent, transparent and defensible results.

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Define Scope

- Valuation objectives
- Identify boundaries
- Establish purpose
- Exclusions and constraints

Develop WBS

- Identify value drivers
- Establish relationships
- Assign quantities
- Map inter-dependencies

Cost Drivers

- Historical insights
- Define distributions
- Quantify uncertainty ranges
- Validate data

Risk Events

- Map risky events
- Assign probabilities
- Incorporate corporate risk register
- Quantify risk

Time Frames

- Valuation date and period
- Phase operations
- Adjust for time value of money
- Timing risks

Capacity Constraints

- Identify constraints
- Allocate resources
- Productivity assumptions
- Efficiencies

Regulatory Requirements

- Map tax and compliance
- Licencing and permitting
- Consider perpetual liabilities

Probabilistic Model

- Apply probabilistic distributions
- Extract key metrics
- Analytical overlays

Interpret Outputs

- Range outputs
- Align with LoM
- Extract key statistics
- Interpretation
- Communicate

Monitoring and Reviews

- Refresh periodically
- Track trends and changes
- Updates
- Integrate lessons learnt

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Probability Weighted Outcomes

Valuation outputs are generated as confidence ranges rather than single point estimates, delivering probability weighted results at defined confidence levels.

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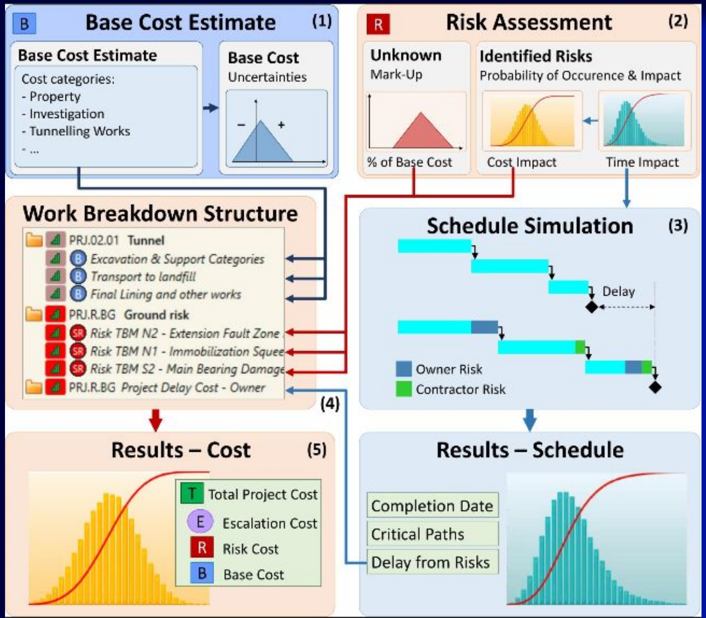

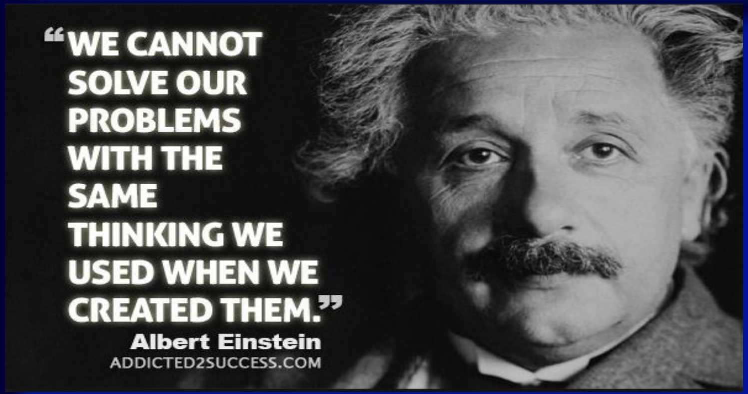

Approximation Using the Central Limit Theorem

The sample distribution of the mean follows a normal distribution. The CLT operates akin to a magical recipe for transforming messy data into a normal curve.

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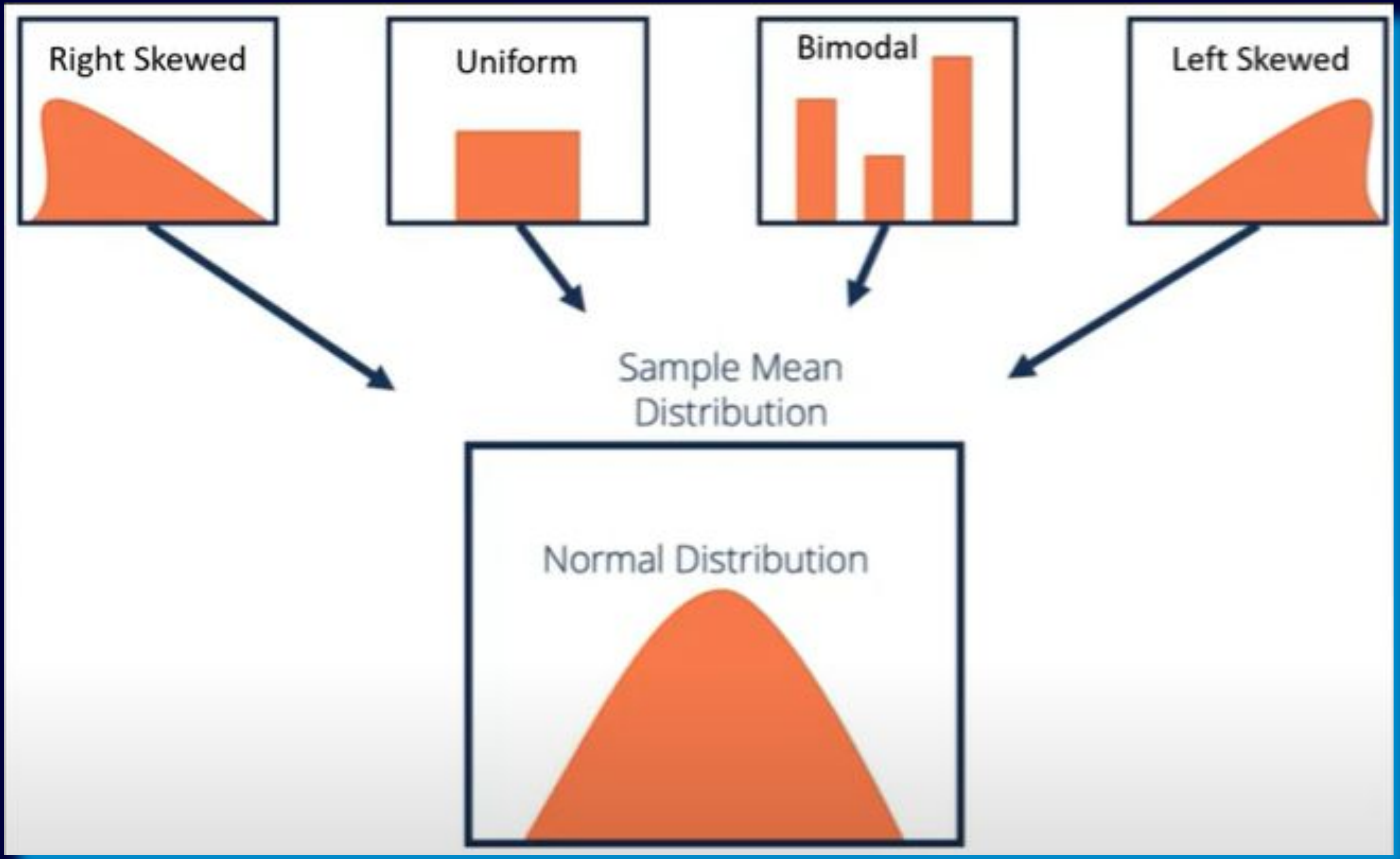

Real Options Analysis

Real options recognise the flexibility to adapt under uncertainty, capturing the added value of choices such as delaying, expanding, or abandoning an investment.

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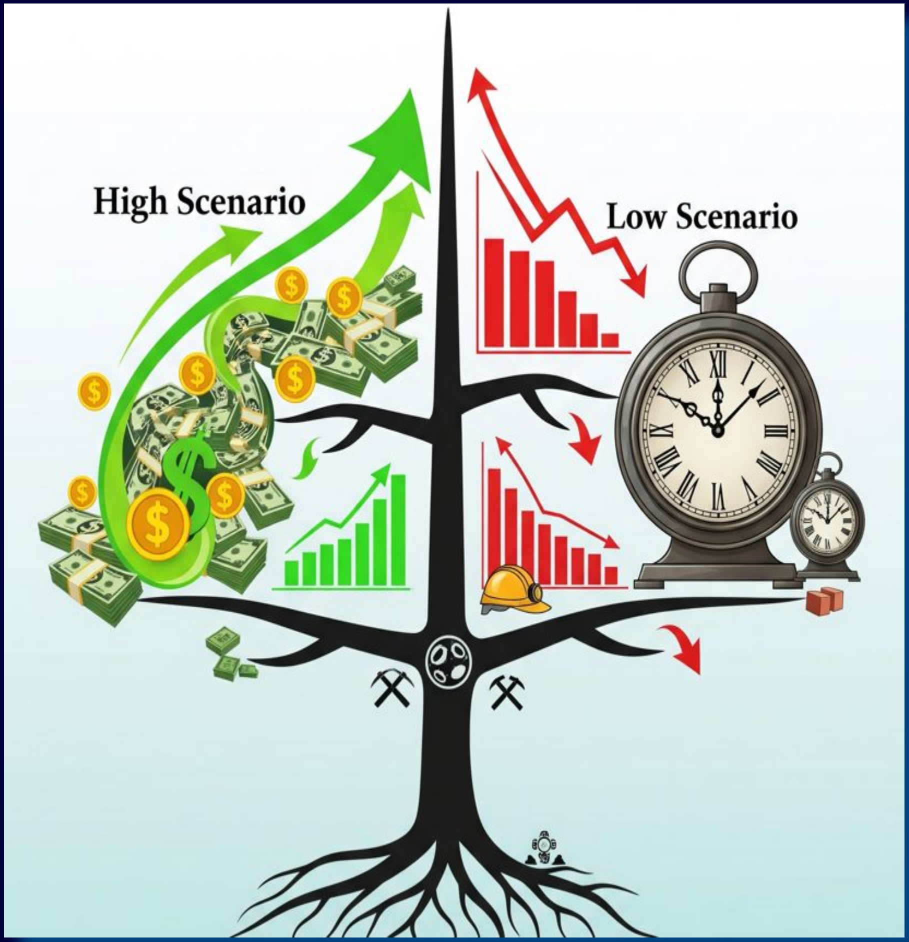

- Timing options:
  Deferral or acceleration will be valued to match market cycles and logistics.
- Scale Options:
  Phased ramp-ups and modular capacity will be priced as strategic choices.
- Switching Options:
  Feed, product or process switching will be assessed where feasible.
- Abandonment options:
  Orderly exit value will be recognised to cap downside risk.
- Closure Options:
  Accellerate or postpone mine closure.
- Funding Options:
  Align financing with staged optionality.

Financing and Credit Support

Advanced valuation techniques underpin credit support by shaping buffers, tenor, volatility management, credit enhancement, default triggers and asset recovery.

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Coverage Buffer
- Acts as a structural coverage buffer
- Tests weakened cash flow over debt tenor

Loan Tenor Justification
- Provides a rational basis for maturity date
- Helps to structure grace periods

Cushion against Volatility
- Absorbs risk from adverse price cycles
- Dampens ramp-up and operational risks

Credit Enhancement
- Improves access to finance
- Improves syndication potential

Trigger Mechanism
- Signals early financial stress
- Acts as a prompt to restructure

Valuation Proxy for Lenders
- Recovery value in downside scenarios
- Assists in capital allocation decisions

Credit Risk Mitigation

Furthermore, these techniques provide a structured basis for credit risk mitigation by providing credit committees with clearer insights into project value, risk and longevity.

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- Provides refinancing support
- Estimator of unencumbered cash flows
- Provides a recovery cushion in default
- Project flexibility in terms of deferrals
- Provides market re-entry options
- Avoids abandonment risk
- Generates optionality and strategic value

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Institutional Lender Support

Additionally, asset valuation strengthens lender support by presenting risk adjusted outcomes that align financing with uncertainties in cash flow and repayment capacity.


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- Provides a direct measure of leverage
- Aligns financing with project value
- Supports risk based pricing
- Enhances credit protection
- Provides lender recovery visibility
- Facilitates layered financing
- Enables dynamic risk monitoring

Future Valuation Models and Data Analytics

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Valuation models will be shaped by advanced data analytics, integrating big data, machine learning and advanced techniques to deliver faster, more accurate results.

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- Integration of AI
- Machine learning
- Cloud based processing
- Integration of big data
- Real time analysis
- Advanced predictive models
- Geo-spatial analytics
- Natural language processing
- Block chain validation
- Advanced visualisation tools

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Implications for Mining

More advanced techniques will better quantify uncertainty, thus improving investment decisions with stronger alignment between risk profiles and financing structures.

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- Risk management: Earlier identification and mitigation will protect value.
- Resilient financing: Robust valuations will improve access to capital.
- Project selection: Better screening will prioritise the strongest options.
- Resource allocation: Capital will flow to the highest value uses.
- Competitiveness: Clearer value cases will win investor attention.
- Confidence: Transparency will lower perceived risk premiums.
- Delivery: Improved planning will lift execution success rates.
- Sustainability: ESG integration will support durable operations.

IMPLICATIONS FOR STAKEHOLDERS

Stakeholder confidence will improve by more defensible, data driven valuation ranges that demonstrate how risks have been quantified and incorporated into decisions.

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- Credible outputs: Sound methods and clear records will attract investors.
- Fewer disputes: Transparent assumptions will reduce disagreement.
- Reputation: Consistent valuations will lift market standing.
- Financing: Bankable evidence will support credit committees.
- Partnerships: Trusted numbers will strengthen commercial ties.
- Market perception: Analysts will rate transparent disclosures more highly.
- Public reporting: Accurate values will meet disclosure requirements.
- Strategic alignment: Shared valuation views will unify decision making.

Governance, Compliance and Ethical Considerations

These will be supported by ensuring that assumptions and risks are transparently modelled, reducing bias and aligning with accepted international reporting standards.


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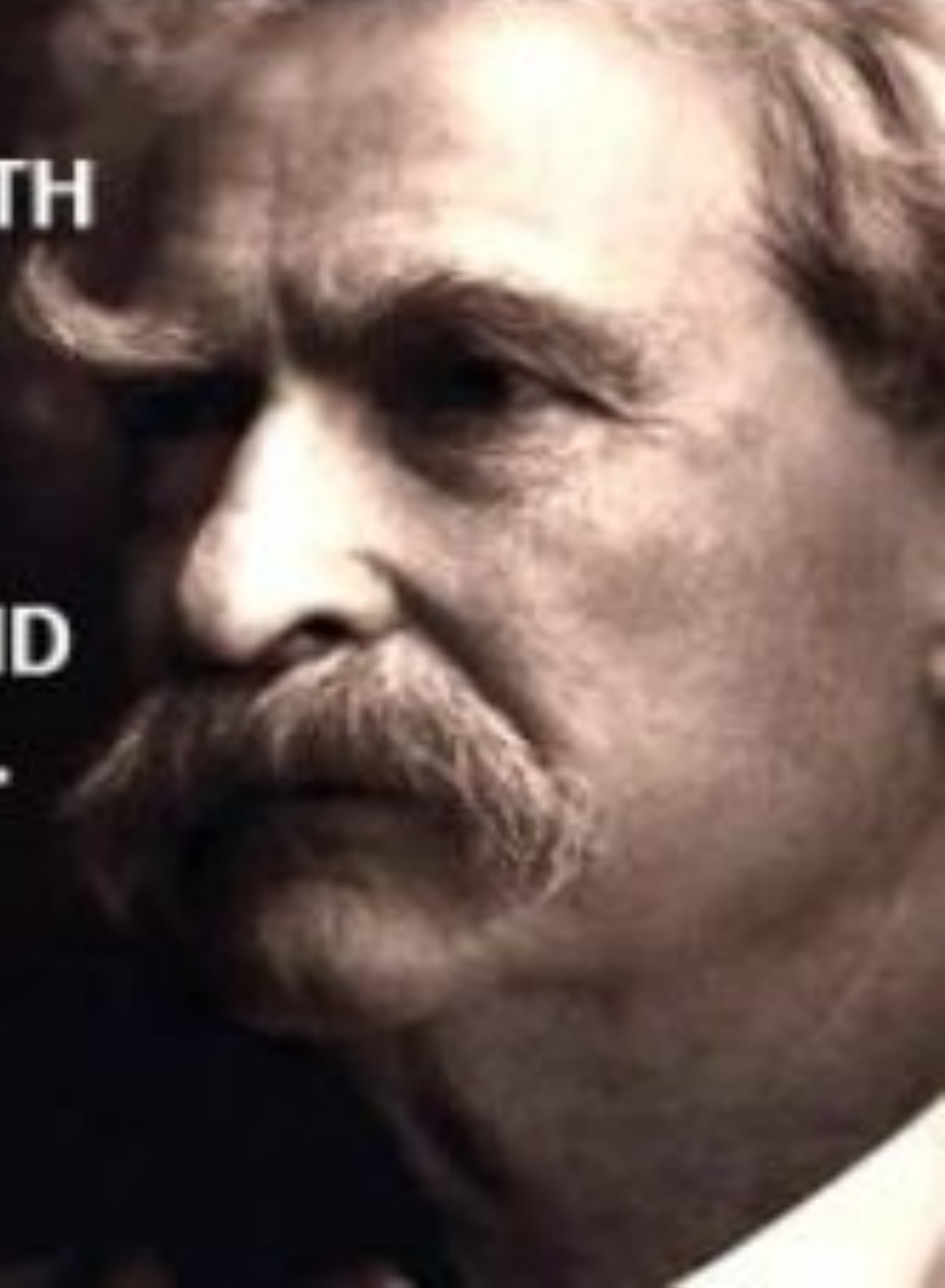
- International Codes: Methods should align with recognised valuation standards.
- Due Diligence: Deliverables should satisfy investor and lender requirements.
- Governance: Internal quality assurance should monitor adherence.
- Compliance: Procedures, policies, standards and protocols must be observed.
- Reporting: Reports should be transparent reflecting honest, independent opinions.
- Assumptions Register: Inputs, sources and justifications should be documented.
- Data Quality: Confidence levels and validation steps should be disclosed.
- Standards: Professional codes of conduct should be adhered to.
- Independence: There should be no conflicts of interest.
- Auditability: Valuation models should be independently audited.
- Transparency: Lines of communication should be clear highlighting assumptions.

IT IS BETTER
TO KEEP YOUR MOUTH
CLOSED AND LET
PEOPLE THINK
YOU ARE A FOOL
THAN TO OPEN IT AND
REMOVE ALL DOUBT.



Thank you…Questions?

Mark Twain