SPEE Denver Chapter July Luncheon Meeting Wednesday, July 10, 2024



Mr. Lachlan Hughson 4-D Resources Advisory LLC - Founder

Enhancing O&G Budgeting/Valuation/M&A Using a Probabilistic Approach

Speaker Bio: M**r. Lachlan Hughson** founded 4-D Resources Advisory LLC to help investors, executives and Boards build better energy and mining companies through enhancing the finance function using a probabilistic approach. He has over 30 years of experience in corporate finance, M&A, capital markets and strategic advisory as an investment banker and energy executive, working at Lehman Brothers, Bear Stearns, Standard Bank, Macquarie and Antero Resources. His education includes an MSc from Imperial College London and an MBA from the Kellogg School of Management, Northwestern University.

He is also a published, award-winning Nature writer – his book, <u>Walkabout to Wisdom – Awakening to Nature's Teaching in the Australian</u> <u>Outback</u>, an Amazon best-seller in 2019 – and an equine-focused philanthropist as a hoof trimmer, equine massage therapist and energy worker.

Abstract: The O&G industry has fundamentally evolved over the last 30 years, primarily from an operational perspective. G&G has evolved from 2-D seismic to 4-D while D&C has evolved from simple vertical wells with simple horizontal completions to complex horizontal wells with complex vertical completions. Yet the finance function has not evolved; it is still using a 30-year-old technology, Excel, to model a dynamic and stochastic world with value-destructive consequences. How do we bring a simple, cost-effective solution to help evaluation engineers provide an order-ofmagnitude greater insight to decision makers through upgrading the finance function?



PRESENTATION TO

SPEE - DENVER

ENHANCING THE FINANCE FUNCTION THROUGH USING A PROBABILISTIC APPROACH

10 July, 2024

Lachlan Hughson

4-D Resources Advisory LLC



4-D Resources Advisory LLC | Value Accretive Insights for Resources Executives and Investors



Introduction

Building better natural resources companies requires a new approach to the corporate finance function – and using a probabilistic approach for financial models is a critical part of that change vs. the traditional, static approach

- A probabilistic mindset and experience already exists in most resource companies – in the technical departments (i.e. geoscience and engineering) with respect to the resource and reserves estimation process
- The reserves model, and the operating and financial data from that model, includes much more information showing the variability of the key operating metrics as best calculated using expected metric variability than calculated by static financial models

Most resources-focused financial models are based on simple, different "2-D" slices taken from the reserves report for production, opex and capex, for base, upside and downside cases, to understand output variability

- While this provides a sense for the variability of the metric being analyzed, these few data points are only an estimate for the population of potential results with no sense for their respective probabilities which is what insightful decisions require
- A probabilistic, or dynamic, approach can now be used across the corporate finance function, to support the traditional static approach, including budgeting, risk management, valuation, M&A, debt raising, hedging and liability management to name just a few of its applications

A probabilistic approach is now possible through the use of probabilistic software - several Excel add-in software packages exist which provide the tools and full Excel functionality for output management and presentation

- @RISK, by Palisade Corporation (Lumivero), is the software I use
- It is used by 93% of Fortune 100 companies, in 94 countries across 25 industries, and has a global user base of 150,000
- It is a software to upgrade Excel to a more functional tool
- 4-D Resources Advisory LLC | Value Accretive Insights for Resources Executives and Investors

4-D RESOURCES CLIENT FRAMEWORK



Setting the Scene



The global energy industry, both traditional and renewables, is the keystone supporting the global economy and the quality of life for billions of people. It is therefore critical it undertakes its strategic, operational and financial decisions, over the company life cycle and the commodity price cycle, using the best tools it can access

While our operational colleagues have fundamentally driven the evolution of the industry, the finance function has barely changed from using the same tool – Excel – for the past 30 years. Is there a way to enhance the finance function to upgrade its models and outputs, and fundamentally enhance the quality of the decisions we make at a company and industry level?

Yes – using a probabilistic approach the same as engineers and scientists currently use

- The Excel add-in (@RISK, Crystal Ball, Others), data, skills and knowledge exist, at both a junior and senior level, to facilitate the use of a probabilistic approach to the finance function in a manner that would enhance the reserve evaluation process
- Would also enhance the budgeting, valuation, M&A, capital raising and Board risk analysis processes



Variability Underlies Model Inputs



The financial model is the primary tool for incorporating strategic, operational and financial data into a form that can be collectively analyzed between Agent and Principal; it specifically defines the outputs on which we base our valuation, M&A, capital raising and risk analysis insights to the client

How do we incorporate the "real-world" variability of data into the financial model for meaningful output analyses?



4-D Resources Advisory LLC | Value Accretive Insights for Resources Executives and Investors

Financial Model Sensitivity Analysis



Static, deterministic financial models using Excel are only able to generate one value per iteration – the sensitivity analysis is generated by running a discrete number of different inputs to calculate a range of potential output value(s). Given the arbitrary decision around input variable ranges, how realistic, and valuable, is this output range?

Consequently, many concerns surround this data quality and its potential for optimizing the decision-making process





Probabilistic Model Inputs

The @RISK software uses different probability and time-series functions to better model the variability of input data – these four examples are from client assignments/transactions in the energy and mining industries. They can be based off historical data or defined in their own right



Probabilistic Model Outputs



The probabilistic outputs from @RISK reflect the variability and correlation of the input variables – these four examples are from client assignments/transactions in the energy and mining industries. The provide a far greater insight into the output variability/risk with a higher degree of confidence than in a tabular form





Building & Leveraging Probabilistic Financial Models

So, how do we enhance our financial models to include the real-world nature of the inputs, their commercial relationships, and highlight the probabilities associated with the resulting outputs?

Through applying a Monte Carlo simulation as the tool which converts our deterministic models into probabilistic models — it will run more iterations in a minute than we can ever hope to mechanically perform in our careers

- · It facilitates an enhanced inclusion of real-world data and the analysis tools to better understand historical relationships
- It provides an order-of-magnitude greater insight into the critical decision variables with a minimal time and dollar cost
- It makes our models far more commercially valuable, and insightful, as it quantifies the probabilities of outputs thus capturing the realworld characteristics of the metric being analyzed



Case Study: Natural Resources Industry Probabilistic Model Key To Upgrading Decision Making





Case Study: Oil & Gas / Midstream A Unique Tool For Enhanced M&A Analysis





Case Study: Oil & Gas / Upstream A Unique Tool To Highlight Investment Risk/Return



Advisory Role FUNDARE REBOURCES COMPANY, LLC	 Fundare Resources Company, LLC recently completed a reserve-based, producing asset acquisition in the Green River Basin and sought to raise equity capital from a group of private investors, some of whom were new to the industry – the debt facility was already in place Executive management wanted a better way to show investors the probabilistic nature of the multiple of invested capital ("MOIC") return they could expect from this equity investment to help them specifically understand where it fell on the risk/return spectrum vs. a simple range of values in a tabular form with no sense for the associated probability Management also wanted to show the value range for the SEC reserves PV-10 given how the variability in commodity prices affects this value, and how changes in the other variables (production, operating costs, capital costs) would impact this value range in totality Management conclusion – "Very thorough and helpful to the capital raising process."
Insights Provided	Common Investor MOIC
Probabilistic Advantages	 Provided a probability-based distribution of values for the metric sought vs. simple tabular form Showed the significant, relative contribution of commodity prices to overall return variability Facilitated quantitative correlation of commodity price changes with other operating metrics Generated a probability-based PV-10 valuation for the SEC reserves vs. single value in report Presented an easy-to-understand, quantitative output for specific investor risk/return analyses Unique way to enhance investor interest through highlighting management financial leadership Low cost, significant value project to the company given unique, informative insights provided

Case Study: Oil & Gas / Midstream A Dynamic Tool For Enhanced Board Governance





4-D Resources Advisory Marketing Focus



We have been recognized as an expert in the natural resources industry as represented in a range of thought pieces, news articles and video presentations as set out below

- Media understanding further supported through writing a diverse range of investor relations' materials and multiple offering prospecti for companies across the natural resources industry
- Upcoming additions include a Fortune magazine article (Houston/Dallas focus) and a 2024 SPE paper/conference presentation
- For these materials, please see the website page at https://4-dresourcesadvisory.com/media/



Lachlan Hughson

Probabilistic Approach

3:23 hours

Explore course







Thank You

CONTACT:

+1-917-783-8833

☑ lachlan@4-DResourcesAdvisory.com

4-DResourcesAdvisory.com

in @lachlanhughson



4-D Resources Advisory LLC | Value Accretive Insights for Resources Executives and Investors