Avoiding pitfalls in business combinations

Common pitfalls in oil and gas reserve valuations

With corporate and bolt-on acquisitions back in the forefront in the oil and gas sector, we revisit issues that frequently arise in upstream valuations for business combinations. Below are five common pitfalls to avoid when determining the fair value of oil and gas reserves.

Lack of consistency in nominal and real inputs

Oil and gas reserves are commonly valued using a discounted cash flow (DCF) method, which is a method within the income approach whereby the present value of future expected net cash flows is calculated by using a discount rate. One of the key considerations at the onset of a reserve valuation is whether the inputs into the future expected cash flows are prepared in nominal (directly accounts for inflation) or real terms (removes effect of inflation). The inputs should then be prepared on a consistent basis throughout the valuation to avoid a mismatch. For example, if an appraiser holds prices flat (assuming real pricing) while escalating expenses, a mismatch will result between the real basis of the revenue line items versus the nominal basis of the expense line items.

Performing a valuation on a nominal basis often requires adjusting price forecasts and incorporating inflation into expenditure forecasts to achieve parity and consistency in long-term profitability margins. The appraiser should discuss any inflationary assumptions already included in the reserve reports with the reserve engineers to obtain an understanding of the adjustments necessary to align the basis of the projected cash flows. Understanding of the inflationary assumptions enables consistency with the nominal assumption of a discount rate.

Using SEC prescribed disclosure methodology as representative of market prices

We often see oil and gas valuations prepared with reliance upon the Securities and Exchange Commission (SEC) prescribed methodology for deriving commodity prices as outlined in the Standardized Measure of Oil and Gas (SMOG) disclosure rule, which results in a historical or backward-looking price estimate. This assumption fails to capture not only inflationary expectations but also real growth or contraction in commodity prices due to market outlook for supply and demand. Therefore, in performing a fair value analysis of the oil and gas reserves, a key input such as commodity prices requires a forward-looking market participant

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perspective, which is considered a Level 1 input under Accounting Standards Codification (ASC) 820, *Fair Value Measurements*. Examples of benchmarks for estimating future prices are:

- Commodity futures as published by the New York Mercantile Exchange, known as the "strip," is a common source for nominal price forecasts.
- Forecasts from independent analysts, such as economic research or investment banking firms, require careful consideration to determine if provided on a real or nominal basis and may require a reconciliation of differences between the various forecasts to complete the selection process.

Reliance on a third-party source for commodity prices adds to the robustness and mitigates some of the risk inherent in an internally developed DCF method or Level 3 input, while the forward-looking nature of the forecasts reflect best available information for a highly cyclical sector.

Using PV 10 as a proxy for fair value

PV10 is the present value of the projected cash flows discounted at 10 percent as prescribed in the SEC SMOG disclosure rule. It is a metric presented in the year-end reserve reports and financial statements of oil and gas companies for comparability purposes. Taking into account that PV10 value relies on a default discount rate of 10 percent and a historical view of commodity prices, and excludes considerations of risk adjustments to the unproven reserves and potential impact of income taxes, it should not be considered an appropriate measure of fair value.

Market participant perspective of the fair value accounting guidance compels the appraiser to further develop an independent estimate of a discount rate, consider all available reserve categories, and assess the impact of income taxes, if applicable. With regard to developing a discount rate, a widely accepted methodology such as a weighted average cost of capital (WACC) is often used. See the KPMG related article, "Avoiding Pitfalls in Business Combinations," for more discussion.

Lack of support for reserve adjustment factors

While the DCF method relies upon the discount rate as a typical measure of risk and return, there are additional risks in reserve categories sometimes not captured in the reserve reports, especially unproven reserve categories. This risk is often accounted for by applying either reserve adjustment factors (RAF) or risk adjusted discount rates (RADR), which help address the same risks but vary in form and application.

RAFs are expressed as a percentage, ranging from 0 percent to 100 percent, and are incorporated in the build-up of the DCF analysis, effectively reducing the projected production volumes with consideration of appropriate OPEX and CAPEX adjustments. RAFs vary across reserve categories with a progressively higher risk adjustment factor applied to increasingly uncertain categories. RADRs are applied as discount rates to the undiscounted cash flows based on the relative risk of each reserve category, with higher rates applied to the unproven reserves.

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Regardless of the methodology for applying risk adjustment factors, we sometimes observe a lack of support for the risk factors selected to capture the underlying risk of each reserve category, whether in applying higher risk factors than typical, or no risking altogether. In addition, a reconciliation of individual risk factors across all reserve categories enables further assessment of the risk profile of the company or assets and ensures the overall fair value conclusion is reasonable. To support this analysis, additional benchmarking to market multiples can be performed and readily available industry survey data can be considered.

No value allocated to unproven reserves

Fair value is defined in ASC 820 Fair Value Measurement in terms of "exit price," as the price that would be received to sell an asset or paid to transfer a liability.[1] Therefore, we frequently observe companies assigning value in a sale of unproven reserves while assigning no value upon acquiring said asset. A deal-making sentiment we often hear is, "nobody pays for unproven reserves," while at the same time same-market players expect to realize value for these in a sell side.

The accounting guidance for fair value requires recognition and measurement of all assets acquired in a business combination, including unproven reserve categories. We typically expect fair value to be assigned to these categories in a business combination analysis, which may compel considering alternatives to the DCF method such as a market approach based on comparable transactions. While internally generated view may indicate minimal value attributed to unproven categories, it benefits the appraiser to develop support and documentation incorporating a holistic market participant perspective.

Summary

The valuation of oil and gas reserves using a DCF method relies upon additional details and assumptions beyond the ones discussed in this document, which captures any specific facts and circumstances. However, avoiding the common pitfalls outlined herein will contribute to the preparation of a supportable fair value analysis.

Additional resources

For additional insight into business combinations, be sure to check out these resources:

KPMG Business Combinations Guide Handbook

Avoiding pitfalls in business combinations

Financial reporting valuations

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[1] Financial Accounting Standards Board (FASB). (June 2022). *Accounting Standards Codification* (ASC 820-10). Retrieved from https://asc.fasb.org/1943274/2147482282

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