

Oil & Gas Spotlight

Navigating the Changing Oil and Gas Landscape

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The Bottom Line

- Crude oil and natural gas prices continue to decline, with West Texas and Brent crude below \$50 per barrel and Henry Hub spot natural gas prices below \$3 per million British thermal units (MMBtu) as of early January 2015. As a result of the falling prices, U.S. oil and gas (O&G) companies will need to continuously assess how best to adapt to the “lower commodities cost” environment.
- The transportation and consumption of oil and natural gas in the continental United States may be directly affected by new regulations and legislation, including (1) the Clean Power Plan proposed by the U.S. Environmental Protection Agency (EPA), (2) railcar rules proposed by the U.S. Department of Transportation (DOT), and (3) proposed laws related to the controversial Keystone XL Pipeline extension.
- O&G companies should evaluate the changing business environment to determine its overall impact on their operations (e.g., potential early-warning signs of impairment resulting from changes in the O&G landscape).
- Exploration and production (E&P) companies that use the successful-efforts method to account for impairment of their O&G assets should apply the guidance in ASC 932-360-35¹ and ASC 360-10-35, whereas E&P companies that use the full-cost method of accounting should apply the guidance in Regulation S-X, Rule 4-10;² SAB Topic 12.D;³ and FRC Section 406.01.c.⁴
- O&G entities operating in the oilfield services, midstream, and downstream sectors may similarly be affected by the changes in the current environment and therefore should consider the guidance in ASC 360-10 when evaluating whether their O&G assets are impaired.
- To determine the fair value of their assets, O&G companies may use valuation specialists, who primarily apply the income approach, the market approach, and the asset approach to make this determination.

¹ For titles of *FASB Accounting Standards Codification* (ASC) references, see Deloitte’s “Titles of Topics and Subtopics in the *FASB Accounting Standards Codification*.”

² SEC Regulation S-X, Rule 4-10, “Financial Accounting and Reporting for Oil and Gas Producing Activities Pursuant to the Federal Securities Laws and the Energy Policy and Conservation Act of 1975.”

³ SEC Staff Accounting Bulletin (SAB) Topic 12.D, “Application of Full Cost Method of Accounting.”

⁴ SEC *Codification of Financial Reporting Policies*, Section 406.01.c, “Full Cost Method.”

Beyond the Bottom Line

This *Oil & Gas Spotlight* gives an overview of the O&G industry's current status in light of recent activities that have affected the industry and may affect it in the future. Understanding the current landscape of the O&G industry may result in the identification of factors that an O&G company should consider in assessing and accounting for impairment of its O&G assets (under the successful-efforts method, the full-cost method, or the guidance on impairment of long-lived assets in ASC 360-10). In addition, this publication discusses approaches commonly used in the valuation of O&G assets.

Background

Commodity prices in the O&G industry have changed dramatically over the past year. Whereas oil prices approached \$90 per barrel in January 2014 and were slightly above \$100 per barrel in July of that year, they have since undergone a steep, steady decline, with West Texas and Brent crude prices below \$50 per barrel through the first couple of weeks of January 2015. Natural gas prices tell a similar story, with the Henry Hub spot prices rising from \$4.32 per MMBtu on January 2, 2014, to a peak of \$7.78 per MMBtu in March 2014 before settling near \$3 per MMBtu in January 2015. The lower oil and natural gas prices will definitely have an impact on the O&G industry as companies are forced to reevaluate how they will operate in this new, "lower commodities cost" environment.

With the lower cost of crude oil and natural gas prices, U.S. O&G companies will need to continuously assess how best to adapt to the changing environment.

Specifically, O&G companies will need to evaluate how and where they are conducting their E&P activities. For example, while there is a definite upside to using hydraulic fracturing techniques in mineral-rich shale formations across the United States, there are questions about the cost-effectiveness and environmental implications of such activities. Similar questions have been raised in connection with deepwater drilling activities in the Gulf of Mexico, which have increased markedly over the past year. Layered on top of this quandary is the fact that the United States, for the first time in its history, will embark on a new journey of being a "net exporter" of liquefied natural gas (LNG) with the construction of liquefaction terminals that are due to go online in 2015.

Further, the O&G industry will ultimately be affected by various regulations and laws. For instance, the EPA's Clean Power Plan will limit power generation by coal-fired plants, thereby increasing the need for natural gas. In addition, the railcar rules proposed by the DOT in July 2014 may directly affect how oil and natural gas are transported in the continental United States. Finally, if Congress passes the controversial bill to allow construction of the Keystone XL Pipeline, such legislation may affect the amount of oil available in the United States.

State of the O&G Industry

Understanding the current state of affairs in the O&G industry is paramount to decision makers of entities that operate in the E&P sector. As discussed above, much has occurred in the industry over the past year. This section will discuss in greater detail considerations related to (1) navigating the lower oil prices, (2) the future of hydraulic fracturing in the United States, (3) Gulf of Mexico drilling, (4) recently proposed railcar regulations and their potential effect on oil shipments, (5) the Keystone XL Pipeline extension legislation, and (6) and LNG export activities.

Navigating the Lower Commodity Prices

With the lower cost of crude oil and natural gas prices, U.S. O&G companies will need to continuously assess how best to adapt to the changing environment. One way O&G entities have responded to the price drop is by reducing their planned capital expenditures. For example, Houston-based U.S. Capital Advisors noted that it expects E&P companies to spend about 10 percent less than originally forecasted and that moderately sized independents could cut their budgets by more than 35 percent.

In addition, while some O&G producers may be shifting their production strategies, other producers are looking for ways to reduce costs without decreasing production. For example, entities operating in the oilfield services sector might experience a significant squeeze to reduce charges and fees, and it is believed that O&G producers could have a significant advantage when it comes to negotiating contracts with those entities. Similarly, O&G producers are beginning to reassess their labor forces in response to the falling commodity prices, and numerous job cuts have been announced.

Further, on top of the exploration and production challenges posed by the falling prices, questions about the financing options available to E&P entities have been introduced to the mix. For instance, as the median ratio of debt to 2015 EBITDA⁵ increases, banks may take a more conservative approach to dealing with producers leveraged in plays that may not be profitable in the current price environment. This might open the door to private equity firms and give them an opportunity to increase their stakes in the E&P sector.

Future of Hydraulic Fracturing

Production in the U.S. shale formations accounts for approximately 20 percent of all crude investment worldwide, and the E&P activity in many of these areas is expected to continue through much of 2015. However, while the practice of hydraulic fracturing⁶ allows E&P entities to tap into O&G reserves that were previously deemed unreachable, it is often a costly endeavor that raises more immediate questions about whether the practice will remain cost-effective and viable as oil and natural gas prices in the United States continue to drop. In addition, hydraulic fracturing still faces pressure from opponents, who argue that the practice makes earthquakes more likely, increases air and water pollution, and damages the surrounding landscape. For example, in December 2014, the governor of New York banned hydraulic fracturing across the entire state.

Gulf of Mexico Drilling

Nearly five years after the April 2010 explosion and fire on the Deepwater Horizon offshore drilling rig that spewed more than 200 million gallons of oil into the Gulf of Mexico and neighboring areas (the “Macondo incident”), development in the Gulf seems to be back in force. Supermajors have invested billions of dollars to renew their drilling operations in the depths of the Gulf of Mexico. Currently, there are more rigs in the Gulf than there were before the Macondo incident, and the resulting production in this region is expected to double over the next 10 years.

Railcar Regulations Related to Oil Shipments

In response to concerns about the safe shipment of flammable liquids and gases by railcar, the DOT proposed new rules on railcar design and railway safety in July 2014. When finalized, these rules will have a direct impact on the transport of crude oil and ethanol by rail.

Under the proposed rules, use of older, DOT 111 tank cars for the shipment of certain flammable liquids (including most Bakken crude oil) would be phased out unless the tank cars are retrofitted to comply with new tank car design standards. In addition, the proposed rules introduce new operational procedures that include enhanced braking controls and speed restrictions for trains that meet the definition of a “high-hazard flammable train” (HHFT). Further, under the proposed rules, carriers would be required to perform a route risk assessment for HHFTs by considering 27 safety and security factors.

Keystone XL Pipeline

Another potential game changer for the U.S. O&G industry would be the approval and construction of the 1,200-mile Keystone XL Pipeline that would connect the heavy crude tar sands of Alberta, Canada, with refineries in Illinois and Texas. While the proposed pipeline has been fraught with controversy because of environmental concerns and political posturing, approval of the project seems to be inching closer with each congressional vote. Although the Republican majority in both the House and Senate is a strong indicator that the proposal will at least be approved by Congress, there is much uncertainty about when (if ever) the project will ultimately be approved by the president. White House approval could be a key bargaining chip as the president seeks to achieve certain items on his agenda in the face of a Republican-controlled Congress.

Regardless of whether this project is approved, the Keystone XL Pipeline extension plans are expected to affect the U.S. O&G industry. If the project is approved, there could be an increase in jobs and capital infrastructure in this industry, potentially followed by lower energy prices. In contrast, if the project is not approved, production at the U.S. shale formations might still be the answer to the country’s increased energy needs.

⁵ Earnings before interest, taxes, depreciation, and amortization.

⁶ Hydraulic fracturing is a well-stimulation technique in which rock is fractured by a hydraulically pressurized liquid. A high-pressure fluid (usually chemicals and sand suspended in water) is injected into a wellbore to create cracks in the deep-rock formations through which natural gas, petroleum, and brine will flow more freely. When the hydraulic pressure is removed from the well, small grains of hydraulic fracturing proppants (either sand or aluminum oxide) hold the fractures open once the deep rock achieves geologic equilibrium.

LNG Export

As the saying goes, every cloud has a silver lining. For the U.S. O&G industry, the silver lining may be the fact that increased O&G production levels have resulted in a strategic shift in which U.S. companies, rather than importing LNG, have embarked on building liquefaction terminals on the coastlines of the continental United States that would allow them to export LNG to other countries, including European nations. The first LNG export is expected in 2015. This may curtail the impacts of the lower natural gas prices in the United States because as U.S. companies become significant players in the global market, their export of any excess natural gas produced domestically could help stabilize those prices.

Key Takeaways for O&G Entities

All of the above changes must be considered by O&G entities that operate in the United States. For example, the lower commodity prices may reduce the viability of drilling since the cost of extracting the oil or natural gas may exceed the revenue generated (i.e., it may not be profitable to drill in certain areas). Therefore, entities should consider their particular facts and circumstances and any potential early-warning signs of impairment, as well as apply the appropriate accounting guidance.

Impairment Considerations Related to O&G Assets

O&G entities engaging in E&P activities can account for their operations by using either the successful-efforts method or the full-cost method. The fundamental difference between these two methods lies in their treatment of costs related to the exploration of new O&G reserves. The method used will directly affect how net income and cash flows are reported. Similarly, the choice of method will have a direct impact on the accounting for impairment.

Like O&G entities in the oilfield services, midstream, and downstream segments, E&P companies that use the successful-efforts method apply the impairment guidance in ASC 360-10, and such entities should consider this guidance when assessing potential impairment of O&G long-lived assets.

Successful-Efforts Method

Under the successful-efforts method, seismic costs are expensed as incurred and costs related to the successful identification of new O&G reserves may be capitalized while costs related to unsuccessful exploration efforts (i.e., drilling efforts that result in a dry hole) would be immediately recorded on the income statement. E&P companies that use the successful-efforts method apply the guidance in ASC 932-360-35 and ASC 360-10-35 to account for the impairment of their O&G assets. Such guidance addresses (1) the timing of impairment testing and impairment indicators, (2) measurement of an impairment loss, (3) the level at which an impairment is assessed, and (4) recognition of an impairment loss.

Timing of Impairment Testing and Impairment Indicators

Under the successful-efforts method, an E&P company generally performs a traditional two-step impairment analysis in accordance with ASC 360 when considering whether to assess proved oil and gas properties for indications of impairment. Generally, this analysis consists of determining when events or circumstances indicate that the carrying value of a company's O&G properties may not be recoverable.

E&P companies that use the successful-efforts method should consider the impairment guidance in ASC 360-10 when assessing potential impairment of O&G long-lived assets.

Proved properties in an asset group should be tested for recoverability whenever events or changes in circumstances indicate that the asset group's carrying amount may not be recoverable. Generally, a company that applies the successful-efforts method will perform an annual impairment assessment upon receiving its annual reserve report by preparing a cash flow analysis as the necessary information becomes readily available. When performing an impairment analysis, such companies should consider risk factors for all reserve categories. Companies can consider proved (P1), probable (P2), and possible (P3) reserves and other resources since these are all included in the value of the assets.

E&P companies should assess unproved properties periodically (i.e., at least annually) to determine whether they have been impaired. The assessment of these properties is based mostly on qualitative factors. Key considerations include (1) development intent; (2) the primary lease term; and (3) recent

development activity, including the drilling results of the entity and others in the industry as well as undeveloped-acreage merger and acquisition activity.

Measurement of Impairment Loss

A company that applies the successful-efforts method will test an asset group for impairment by using the two-step process detailed in ASC 360. Under step 1, the company will perform a cash flow recoverability test by comparing the asset group's undiscounted cash flows with the asset group's carrying value. The carrying amount of the asset group is not recoverable if it exceeds the sum of the undiscounted cash flows that are expected to result from the use and eventual disposition of the asset group.

If the asset group fails the cash flow recoverability test, the company will perform a fair value assessment under step 2 to compare the asset group's fair value with its carrying amount. An impairment loss would be recorded and measured as the amount by which the asset group's carrying amount exceeds its fair value, as determined in accordance with ASC 820.

Level at Which Impairment Is Assessed

When determining the level at which an impairment should be assessed, a company that applies the successful-efforts method should consider whether the property is proved or unproved. Proved properties must be grouped at the lowest level for which there are identifiable cash flows that are largely independent of the cash flows of other groups of assets. Typically, the impairment evaluation of O&G-producing properties is performed on a field-by-field basis or, if there is a significant shared infrastructure (e.g., platform), by logical grouping of assets. Unproved properties should be assessed on a property-by-property basis or, if acquisition costs are not significant, by an appropriate grouping.

Recognition of Impairment Loss

An impairment loss for a proved property asset group will reduce only the carrying amounts of the group's long-lived assets. A company should allocate the loss to the long-lived assets of the group on a pro rata basis by using the relative carrying amounts of those assets; however, the loss allocated to an individual long-lived asset of the group should not reduce the asset's carrying amount to less than its fair value if that fair value is determinable without undue cost and effort. For unproved properties, if the results of the assessment indicate impairment, a company should recognize a loss by providing a valuation allowance. Under the successful-efforts method, companies are prohibited from reversing write-downs.

Full-Cost Method

Unlike the successful-efforts method, the full-cost method allows E&P companies to capitalize nearly all costs related to the exploration and location of new O&G reserves regardless of whether their efforts were successful. To assess whether their O&G assets are impaired, E&P companies that use the full-cost method of accounting should apply the guidance in Regulation S-X, Rule 4-10; SAB Topic 12.D; and FRC Section 406.01.c. Like successful-efforts accounting guidance, this guidance addresses (1) the timing of impairment testing and impairment indicators, (2) measurement of an impairment loss, (3) the level at which an impairment is assessed, and (4) recognition of an impairment loss.

Timing of Impairment Testing and Impairment Indicators

Under the full-cost method, a full-cost ceiling test must be performed on proved properties each reporting period. Further, unproved properties must be assessed periodically (at least annually) for inclusion in the full-cost pool, subject to amortization.

Measurement of Impairment Loss

The full-cost accounting approach requires a write-down of the full-cost asset pool when net unamortized cost less related deferred income taxes exceeds (1) the discounted cash flows (DCFs) from proved properties (i.e., estimated future net revenues less estimated future expenditures to develop and produce proved reserves), (2) the cost of unproved properties not included in the costs being amortized, and (3) the cost of unproved properties included in the costs being amortized. The write-down would be reduced by the income tax effects⁷ related to the difference between the book basis and the tax basis of the properties involved.

⁷ For purposes of this calculation, the tax effects cannot result in a net tax benefit.

Level at Which Impairment Is Assessed

Companies that apply the full-cost method generally establish cost centers on a country-by-country basis and assess impairment at the cost-center level.

Recognition of Impairment Loss

When recognizing an impairment loss, companies that apply the full-cost method should reduce the carrying value of the full-cost asset pool and record the excess above the ceiling as a charge to expense in continuing operations. Like the successful-efforts method, the full-cost method precludes companies from reversing write-downs.

Thinking It Through

The downward decline in commodity prices may have impairment implications for E&P companies that use the full-cost method of accounting. Specifically, since the trailing 12-month prices in 2015 will continue to decline unless prices recover in the near term, it is likely that impairment risk will continue into 2015. Accordingly, E&P companies should focus on risk-based and early-warning disclosures when impairments are expected to occur in the future.

Impairment of Long-Lived Assets Under ASC 360-10

Falling commodity prices and other changes in the O&G industry may also directly affect the value of assets held by entities operating in other segments of the industry, including the oilfield services, midstream, and downstream sectors. Like other long-lived assets within the scope of the impairment guidance in ASC 360-10, assets in these O&G segments should be evaluated for impairment under ASC 360-10.

Timing of Impairment Testing and Impairment Indicators

O&G entities in the oilfield services, midstream, and downstream sectors would generally perform a traditional two-step impairment analysis in accordance with ASC 360 when considering whether to assess O&G assets for indications of impairment. Generally, O&G assets in an asset group should be tested for recoverability whenever events or changes in circumstances indicate that the asset group's carrying amount may not be recoverable. Examples include, but are not limited to, a major decline in the asset's market value, an adverse change in the manner or extent of the asset's use, and a current-period loss coupled with a history or expectation of future losses. When these indicators exist, an entity would be required to assess its assets for impairment.

Measurement of Impairment Loss

Oilfield services, midstream, and downstream entities will test an asset group for impairment by using the two-step process detailed in ASC 360. Under step 1, a company will perform a cash flow recoverability test by comparing the asset group's undiscounted cash flows with the asset group's carrying value. The carrying amount of the asset group is not recoverable if it exceeds the sum of the undiscounted cash flows that are expected to result from the use and eventual disposition of the asset group.

If the asset group fails the cash flow recoverability test, the company will perform a fair value assessment under step 2 to compare the asset group's fair value with its carrying amount. An impairment loss would be recorded and measured as the amount by which the asset group's carrying amount exceeds its fair value, as determined in accordance with ASC 820.

Recognition of Impairment Loss

An impairment loss for an asset group will reduce the carrying amounts of the group's long-lived assets. A company should allocate the loss to the long-lived assets of the group on a pro rata basis by using the relative carrying amounts of those assets; however, the loss allocated to an individual long-lived asset of the group should not reduce the asset's carrying amount to less than its fair value if that fair value is determinable without undue cost and effort. It is important to note that after an impairment loss is recognized, the adjusted carrying amount of the asset would be its new accounting basis. Subsequent reversal of a previously recognized impairment loss is prohibited.

Thinking It Through

The decrease in commodity prices may have a significant impact on the operations of O&G entities in the oilfield services, midstream, and downstream sectors. As a result, O&G entities may need to reassess the valuation of their assets under ASC 360-10 and other U.S. GAAP as follows:

- *Oilfield services* — As companies in the upstream sector curtail the number of drilling rigs that they are actively running in their programs, there may be a corresponding slowdown in services provided as a result of fewer actively working rigs in 2015. Therefore, fewer wells are expected to be completed and brought online. Like companies in the midstream sector, oilfield services companies may need to consider the potential impacts of a reduction in upstream activity on their future cash flows.
- *Midstream* — If the upstream sector begins to curtail drilling operations, production is likely to decrease. Consequently, the midstream sector should focus on impairment indicators as a result of the potential decline in production, which could lead to lower gathering and processing volumes.
- *Downstream* — Companies in the downstream sector that have acquired significant inventory over the past several years may have LIFO⁸ layers currently recorded at much higher prices. Therefore, they may have to consider the declining commodity prices in the context of their inventory valuation as well as the valuation of long-lived assets.

Valuation of O&G Assets

Valuation Approaches

To determine the fair value of assets, valuation specialists primarily rely on three approaches:

- *Income approach* — Under this approach, valuation techniques are used to convert future amounts (e.g., cash flows or earnings) to a single present amount (discounted). The measurement is based on the value indicated by current market expectations about those future amounts.
- *Market approach* — This approach requires entities to consider prices and other relevant information in market transactions that involve identical or comparable assets or liabilities, including a business. Valuation techniques commonly used under the market approach include the guideline public company method⁹ and the guideline transaction method.¹⁰
- *Asset approach* — Under this approach, which is also known as the cost approach, the value of a business, business ownership interest, or tangible or intangible asset is estimated by determining the sum required to replace the investment or asset with another of equivalent utility (sometimes described as future service capability).

In certain situations, valuation specialists may employ multiple valuation approaches when performing a fair value analysis to explore different scenarios and confirm the reasonableness of an estimate. The usefulness of a particular valuation approach may vary from year to year.

Although companies in the industry most commonly apply the income approach (by using a DCF model), other approaches may be more appropriate in certain circumstances. Further, an alternative such as the market approach is often used to confirm the reasonableness of the DCF model.

⁸ Last-in, first-out.

⁹ The guideline public company method employs market multiples derived from stock prices of companies engaged in the same or similar lines of business whose shares are actively traded in a free and open market. The application of the selected multiples to the corresponding measure of financial performance for the subject company produces estimates of value at the marketable minority level.

¹⁰ The guideline transaction method, also referred to as the transaction method or the merger and acquisition method, relies on pricing multiples derived from transactions of significant interests in companies engaged in the same or similar lines of business. The application of the selected multiples to the corresponding measure of financial performance for the subject company produces estimates of value at the marketable control level.

Thinking It Through

When determining the fair value of O&G reserves, E&P companies use various methods and approaches. Approximately 90 percent of them use a DCF model to estimate the fair value of O&G reserves. A rule-of-thumb method of determining these reserves' fair value, although not originally intended for that purpose, is the SEC's "PV-10," under which fair value is defined as the present value of the estimated future O&G revenues, reduced by direct expenses and discounted at an annual rate of 10 percent. While the SEC's overall goal in requiring registrants to use this metric was to make amounts reported by companies comparable, it is now frequently used to evaluate the fair value of E&P companies' proved O&G reserves.

The 10 percent discount rate can serve as the starting point for discounting projected cash flows from proved O&G reserves in an investor case reserve report. Further analysis should then be conducted to determine the appropriate rate to be applied to the amounts in the report. This analysis, which may vary by reserve category, will involve judgment and should be based on the company's specific facts and circumstances.

Key Assumptions Under the Income Approach

In determining the fair value of their assets, O&G companies must ensure that the valuation approach and related model they use are based on appropriate and accurate assumptions that are consistent with the market participant concept (i.e., they must use factors and assumptions that would be used by buyers and sellers in the principal or most advantageous market for the asset or liability). Assumptions that companies should consider incorporating in the DCF model include those related to (1) cash flow projections, (2) pricing and price differentials, (3) discount rate, (4) risk factors, and (5) the tax effect. Understanding the basis for those assumptions is just as important as understanding their nature.

Thinking It Through

When applying the income approach, O&G companies should evaluate the assumptions to be used in their DCF models as follows:

Cash Flow Projections

O&G companies need to determine the cash flow projections that will be incorporated in their DCF models. Generally, these projections are based on a production profile that is developed by a third-party engineering firm or prepared internally by company engineers.

Pricing and Price Differentials

Generally, E&P companies use forward strip pricing as determined by the New York Mercantile Exchange (NYMEX) or other pricing benchmarks (e.g., Brent, WTI) in their DCF models. Forward strip pricing over a period of up to five years is useful for valuation purposes since there is active futures trading activity within that time horizon. Beyond the last date of the forward strip, a company should estimate prices by using more subjective judgments that typically involve applying an inflation factor to the NYMEX futures price. Pricing benchmarks can vary greatly depending on location.

Commodity price differentials are another key metric that could affect the assumptions used in the DCF model. Oil and natural gas prices can vary as a result of multiple factors, including (1) quality, (2) transportation costs, and (3) proximity to market or delivery point.

Discount Rate

E&P companies should consider various factors when determining the discount rate to use in their valuation models. One consideration is the basis for the discount rate (e.g., whether to use a weighted average cost of capital (WACC)¹¹ rate or rates detailed in the SPEE¹² annual survey). Also, companies need to consider whether to use an after-tax discount rate or after-tax undiscounted cash flows in their fair value calculations.

¹¹ The WACC is the rate that a company is expected to pay on average to all of its securityholders to finance its assets.

¹² The Society of Petroleum Evaluation Engineers (SPEE) conducts an annual survey of industry executives, consultants, and other energy industry stakeholders to develop insights about the risk factors and discount rates commonly used in analyzing property values throughout the O&G industry. This survey could serve as a good reference point for determining the appropriateness of the assumptions used to measure the fair value of proved reserves.

Risk Factors

Since unproved reserves are inherently more uncertain than proved reserves, risk factors related to unproved reserves are much more significant than those related to proved reserves. Therefore, risk factors are applied to the valuation of unproved (i.e., P2 and P3) reserves.

When E&P companies perform an impairment analysis under the successful-efforts method, they typically use a zero percent risk factor for proved properties. When these companies perform purchase accounting, however, they apply a variety of risk factors to different categories of proved reserves. This seeming inconsistency in practice could prompt auditors and regulators to raise questions about how the risk factors are being applied. Further, when E&P companies perform a valuation of O&G assets, they either (1) incorporate the risk factors in the discount rate or (2) apply the risk factors to DCFs.

Tax Effect

E&P companies should also consider whether to incorporate assumptions about the tax effect in the DCF models. This consideration is critical since results may vary depending on whether pretax or post-tax amounts are used. Generally, pretax models are more commonly used in the valuation of O&G assets outside the United States.

Key Assumptions Under the Market Approach

As they would under the income approach, O&G companies should apply the market participant concept when determining the fair value of their O&G assets under the market approach. For example, discount rates should be estimated from the standpoint of other buyers and sellers. Although fair value from the market participant's point of view is often the same as fair value from an O&G company's standpoint, the company should ensure that it is considering the same factors and assumptions that the market participant would take into account.

Selecting the Appropriate Method

When applying the market approach, an O&G company must first determine the appropriate method to use (i.e., either the guideline public company method or the guideline transaction method) by considering various factors. These factors vary depending on the particular O&G sector in which the company operates.

E&P companies should select a method on the basis of the following considerations:

- Size (market capitalization or reserve volumes).
- Natural gas versus oil mix (i.e., the percentage of reserves or production represented by natural gas versus oil).
- Reserve life.
- Areas or basins of operation.

Generally, the guideline transaction method is challenging for E&P companies to use because (1) finding new resource plays is difficult, (2) multiples in the same play can vary greatly, and (3) undeveloped acreage multiples from market transactions are rarely published.

Companies operating in the oilfield services sector should consider the following factors when determining which method to use:

- Similar mix of operations (e.g., onshore and offshore, regional and global).
- Operational makeup (i.e., technology, equipment, construction).

Finally, companies operating in the downstream sector should consider the following:

- Locations and access to cheaper crude oil.
- Crude oil capacity.
- Refining complexity (i.e., complexity is an indication of the value of the refined products that a refinery produces).

- Utilization (i.e., refineries with similar utilization rates are comparable).
- Diversification (i.e., pure-play refiners are not comparable to refiners that also have midstream assets).

Thinking It Through

Generally, Deloitte valuation specialists use the market approach to confirm reasonableness when a valuation was not primarily based on a DCF estimate. Regulators have indicated that multiple approaches may be used to measure the value of assets and liabilities. When using the market approach, a company should ensure that it is “comparing apples to apples” because there could be significant differences among market transactions and among peer companies. For example, transactions that are seemingly similar can differ significantly, especially if they involve different resource plays.

Thinking Ahead

Deloitte’s O&G practice will continue to monitor current and future activities related to (1) accounting standard setting, (2) SEC rulemaking, and (3) regulatory compliance requirements. Periodically as warranted, it will provide updates that detail the potential effects of these activities on your business or the industry as a whole. The periodic communications will consist of (1) multiday industry seminars, (2) *Dbriefs* webcasts, (3) *O&G Spotlight* communications, and (4) roundtable discussions.

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