

*Valuing the
great shale play*

the study. The first author (SM) was the primary investigator and was responsible for the design, data collection, data analysis and writing of the manuscript. The second author (MM) was responsible for the design, data collection, data analysis and writing of the manuscript. The third author (MM) was responsible for the design, data collection, data analysis and writing of the manuscript. The fourth author (MM) was responsible for the design, data collection, data analysis and writing of the manuscript.

2. Methods

2.1. Design

The study was a descriptive study of the prevalence of the risk factors for the development of the disease.

2.2. Study population

The study population consisted of 1000 individuals who were randomly selected from the general population.

2.3. Data collection

Data were collected through a series of interviews and questionnaires administered to the study population.

2.4. Data analysis

Data were analysed using statistical software to determine the prevalence of the risk factors and their association with the disease.

2.5. Ethical approval

The study was approved by the local ethics committee and all participants gave their informed consent.

2.6. Results

The results of the study are presented in Table 1, showing the prevalence of the risk factors and their association with the disease.

2.7. Discussion

The findings of this study suggest that the risk factors for the development of the disease are significantly associated with the disease.

2.8. Conclusion

The study concludes that the risk factors for the development of the disease are significantly associated with the disease.

2.9. Acknowledgements

The authors would like to thank the participants and the staff of the study for their cooperation and assistance.

2.10. References

1. Smith, J. M., & Jones, A. B. (2001). The prevalence of risk factors for the development of the disease. *Journal of Epidemiology and Community Health*, 55(10), 712-718.

Once considered an unconventional resource, shale gas today is viewed by many as an important component of the domestic energy portfolio. If your company is eager to join in the ‘shale rush,’ make certain you take steps to ensure that acquired reserves are properly fair valued for financial reporting purposes.

It's not difficult to find headlines today that trumpet the future of shale gas in the U.S. Big discoveries, big investments and a surge in mergers and acquisitions related to shale reserves send a strong signal that the industry has high hopes for these resource plays.

After a decade or so of declining domestic natural gas production in the Gulf of Mexico – and subsequent investments in liquefied natural gas facilities designed to meet U.S. demand via imports – shale gas has come of age, with the potential to dramatically impact the country's energy portfolio.

In fact, all indications are that the market share of natural gas will increase substantially in the coming years. One such study predicts that the market share of natural gas will double, from today's 20 percent to 40 percent or more, by 2050.

Much of that gas is expected to be of the type considered unconventional just a few years ago, such as shale. Since the mid-2000s, large-scale production has been ongoing in the Barnett Shale area of Texas, and the number of wells drilled in the Marcellus Formation in the Appalachian Basin is growing rapidly. The Bakken Shale and Haynesville Shale regions are also experiencing growth.

According to another study, unconventional production will account for more than 50 percent of North American supplies by 2020. In the U.S., unconventional gas production will account for 58 percent of total production, while another makes a more aggressive prediction of 64 percent.

Shale M&A activity is booming

These forecasts, and others like them, are seconded by the actions of the marketplace. The first three quarters of 2010 saw shale gas M&A deal value of approximately \$20.1 billion, compared to approximately \$6.8 billion in the same time frame of 2007. This increase in activity is a result of energy majors using their financial strength to obtain access to shale reserves, which previously had been the domain of small independents.

Major oil companies have invested significant dollars in domestic shale plays, betting on shale's ability to meet growing U.S. demand. The M&A trend is also being driven by a belief that future environmental laws will mandate the use of cleaner-burning fuels such as natural gas. In addition, attractive economics – based in part on advances in drilling technology and reservoir optimization programs – have lowered the cost of production, giving shale plays lower breakeven thresholds than conventional sources.

Finally, improving midstream infrastructure – a result of pipeline companies' response to shale potential – has made it easier to get produced gas to market. The proximity of some of these producing regions to areas of high demand – such as Marcellus' location near the East Coast – makes them especially worthwhile.

Recently there has been debate as to whether this heightened level of activity around shale is sustainable. Some industry experts point out that the market is currently focusing upon the quantum of gas being produced rather than its value and the overall supply/demand equation. Given the number of projects currently under way or in the planning stages, there is the risk that gas prices may continue to face sustained downward pressures in the foreseeable future. Potential mitigating factors include demand growth as natural gas plays a more meaningful role in electricity generation; demand from China and other Asian economies as economic activity rebounds; and continuing advancements in fracturing technologies that further improve the economics of shale gas production.

Valuation issues are key

Companies who seek to acquire domestic shale reserves must be aware of fair value reporting guidelines under U.S. Generally Accepted Accounting Practices (GAAP) that can have a significant impact on how an acquisition is booked.

Under previous asset acquisition accounting rules, companies could purchase property or assets and simply pro-rata allocate the sales price to the assets acquired. With the recent revision of Accounting Standards Codification (“ASC”) 805 “Business Combinations” most acquisitions that under previous guidance were treated as asset acquisitions are now required to be recognized as business combinations. This requires that companies must separately fair value the assets and liabilities acquired with any difference between the purchase price and the fair values of the acquired assets and liabilities being recognized as goodwill or a bargain purchase depending upon the facts and circumstances of the deal.

Since the major component of most shale deals (or any upstream acquisition) is reserves, the fair value of the acquired reserves is critical to the overall financial statement impact of the acquisition. While companies are eager to enter shale plays and sometimes are willing to pay a premium to do so, the market price of natural gas is at a five-year low with new production coming online regularly. This gap may lead to a substantial difference in the actual valuation of the deal for financial reporting purposes. Another factor that can lead to value adjustments is the timing of cash flows and the inability to obtain capital to fund production due to lower gas prices.

Given the chasm between strategic value and fair value, it is critical that the deal team and the financial reporting and tax teams work together from the beginning of negotiations to avoid significant value adjustments after close. In addition, chief financial officers and controllers must ensure that the proper processes are in place to accurately measure and report the company’s acquired assets in accordance with GAAP.

Where to focus

If your company is considering an acquisition or merger to obtain shale acreage or reserves, consider these key financial reporting considerations:

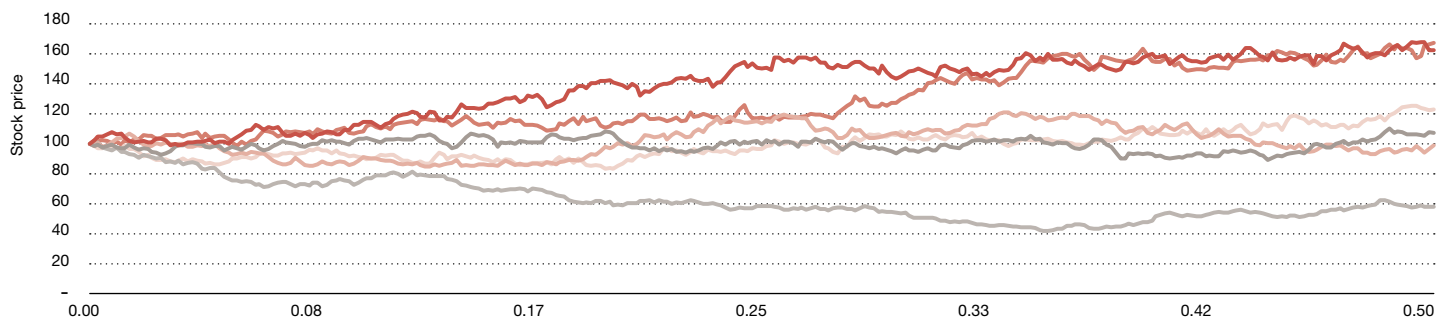
Transaction pricing date vs. transaction close date:

M&A teams sometimes set the transaction price and reserve valuation parameters (such as the price deck) at a date other than the closing date. However, financial reporting standards today require that assumptions and market data as of the closing date be used to determine fair value.

A company typically seeks to fund acquisitions via cash, stock or a combination of both. In the case of publicly traded companies stock prices can potentially move in either direction affecting the potential for either recognizing goodwill or a bargain purchase.

As an illustration of this point assume that a publicly traded upstream company (Company A) has made an offer to purchase another upstream company (Company B) for a consideration of \$10 million in the form of 100,000 shares at \$100/share established at January 1. We also assume that company B is all equity financed and that the fair value of the acquired reserves and other assets are \$9.5 million implying goodwill of approximately \$0.5 million. We have simulated six possible stock price paths illustrated in the chart below based upon hypothetical market data to gauge the effects of potential closing prices on the potential level of goodwill or bargain purchase that may result.

Potential stock price scenarios



Scenario	1	2	3	Jan 1	4	5	6
Possible April 1 Prices	65	76	77	100	112	133	166
% Above/ (Below) Jan 1 Price	(35%)	(24%)	(23%)	0%	12%	33%	66%
Potential Consideration (\$ Million)	6.5	7.6	7.7	10.0	11.2	13.3	16.6
Less: Fair Value of Assets Acquired	9.5	9.5	9.5	9.5	9.5	9.5	9.5
Potential Goodwill/Bargain Purchase	(3.0)	(1.9)	(1.8)	0.5	1.7	3.8	7.1

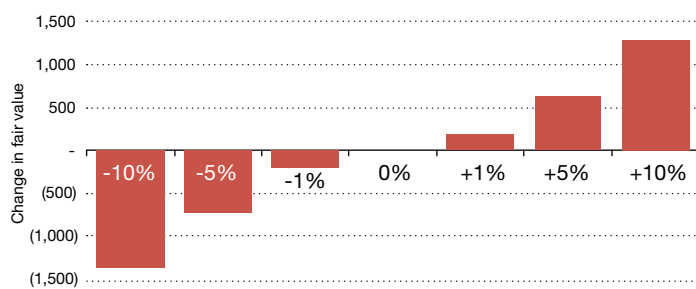
As one can see from the table above, changes in stock prices themselves may have significant impact upon the potential level of goodwill or bargain purchase that may be realized once the deal closes. The above example also illustrates the importance of appropriately structuring sale and purchase agreements where stock consideration is factored into the deal. More complex scenarios could be developed that examine the inter-relationships between stock prices of upstream companies, commodity prices and the fair value of the underlying reserves.

As such it is imperative that your financial reporting team be connected with the deal team early in the process to communicate financial reporting requirements and to ensure that the proper valuations and assessment are included in all reports to your board of directors and various executive committees – long before the purchase agreement is finalized.

Commodity prices: The preferred choice for establishing fair value is the NYMEX strip price as of the closing date, which is considered a Level 1 input in the fair value hierarchy under ASC 820 “Fair Value Measurements and Disclosures”. When pricing reserves, acquiring companies sometimes use a price deck designed to reflect their internal expectations on the outlook for oil and gas prices. Obviously these prices can differ substantially from the NYMEX strip price on the date your acquisition closes.

Continuing our illustration financial reporting teams may wish to understand and communicate the impact of changes in the futures strip on the fair value of the acquired reserves and any potential financial statement implications. An example of a possible scenario analysis may include “shocking” the NYMEX curve up and down by certain percentages and observing the impact on the fair value of the reserves and resulting potential range of goodwill and bargain purchase scenarios (figure and table below).

Reserve fair value sensitivities—Parallel shift in NYMEX



Parallel shift in NYMEX strip							
Amounts in \$000s	-10%	-5%	-1%	0%	+1%	+5%	+10%
Purchase consideration	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Fair value of reserves acquired	6,640	7,280	7,800	8,000	8,200	8,640	9,280
Fair value of other assets	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Potential goodwill/(bargain)	1,860	1,220	700	500	300	(140)	(780)

Risking of reserves: In conventional resource plays, there is inherent risk related to recovering the stated quantity of reserves. This uncertainty is usually reflected by risking estimated reserves by various factors.

In shale, recovery risk is typically much lower due to the geologic nature of the formation. The primary risk for shale is the likelihood of commercial production due to fluctuating commodity prices and capital costs.

Typically, companies incorporate risking into their analyses by assuming that a certain portion of the acreage acquired will not be viable based on available technical data and drilling results from proximate acreage locations.

To maximize the accuracy of these assumptions, sensitivity and scenario analyses should be incorporated into your financial teams’ processes, enabling the company to more effectively communicate the financial implications of the transaction to shareholders— including the prospective levels of depletion and estimates of the quantum of potential goodwill or possible bargain purchase likely to be recognized.

Income taxes: Often, reserve reports do not include federal income taxes. However, federal taxes should be considered in establishing the fair value of acquired reserves, as appropriate.

This is consistent with the market participant notion in the definition of fair value in ASC 820. As a matter of best practice, the tax status of market participants should be considered, analyzed and documented during the deal process, which will facilitate a more robust dialogue with external auditors and regulators.

If it is assumed that the appropriate market participant is a tax-advantaged entity (i.e. no taxes paid at the corporate level – including owners of flow-through entities), it is important to ensure that the guideline companies used in computing the Weighted Average Cost of Capital (WACC) reflect this tax-advantaged status. A typical assumption is the use of master limited partnerships in order to derive a “pre-tax” WACC.

A typical corporate market participant would likely consider the cash outflow associated with paying federal income taxes in their evaluation of incremental cash flow gained from acquiring reserves. Apart from identifying and analyzing who the likely universe of market participants would be, a thorough review of the assumptions surrounding the timing of future tax payments should be made. A common pitfall is the typical assumption of no or very minimal federal taxes.

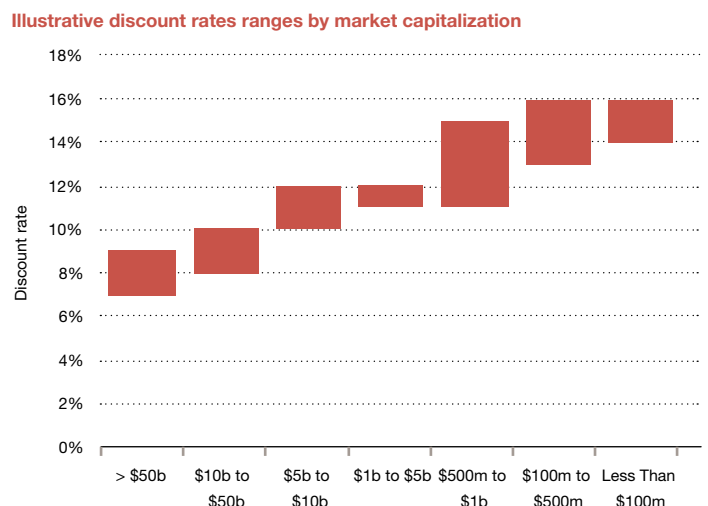
It is often assumed that the level of tax-shield provided by intangible drilling costs incurred or expected to be incurred by the target company in its ongoing capital programs (apart from the reserves being acquired) will provide a respite from federal taxes. However, fair value is set at the level of the asset/liability acquired. Consideration of federal taxes in fair valuing acquired reserves should only consider federal tax implications specific to those reserves – and must exclude the effects of other capital programs elsewhere in the acquirer’s company.

Under current rules, companies are allowed to deduct depletion in computing taxable income. An adjustment that is not usually included in deal models is a tax depletion bonus. Typically in an M&A environment, the analysis focuses upon determining a fair market value of equity in the target company that will be subject to a negotiation process.

Because ASC 805 designates the unit of account as the individual assets that are exposed to the market with a presumed transfer of the incremental tax benefits to the acquirer irrespective of the (non-) taxable structure of the transaction, a tax benefit can be computed. Furthermore, the inclusion of the depletion bonus is implicit in ASC 740 “Income taxes”, which requires assets acquired and liabilities assumed to be stated at their “gross” fair value.

Discount rate: In establishing the fair value of acquired reserves the discount rate or WACC should be reflective of the required rate of return required by market participants, ideally from companies with similar reserve profiles as those being acquired. Since ASC 932 “Extractive Activities - Oil and Gas” became effective in 1982, a 10 percent discount rate has been the standard discount rate used by upstream companies.

The main purpose of ASC 932 was to develop a standardized measure of reporting and measuring a potential write-down, for oil and gas reserves accounted for under the full-cost method. The FASB did not intend for the amount calculated under ASC 932 to represent fair value or fair market value. Because discount rates using market data can often differ from 10 percent, analyses should be prepared to support the selected discount rate. The figure below illustrates a range of discount rates for oil & gas companies by market capitalization.



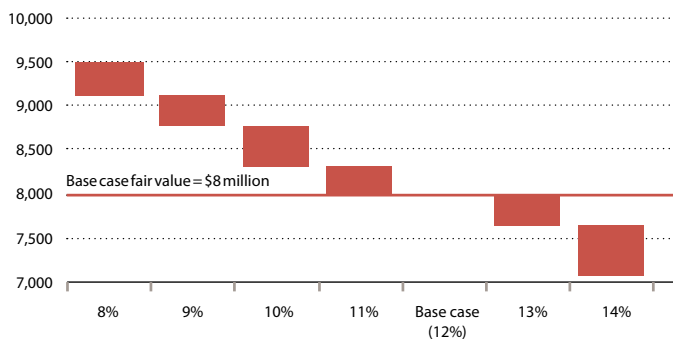
* Excludes any consideration given to specific entity risk

Remember that it is important to determine whether market participants are taxable or tax-advantaged entities to determine whether a pre-tax WACC or a post-tax WACC needs to be computed.

In addition, the discount rate/WACC should be established as of the closing date of the transaction for financial reporting purposes. This is another area of potential difference between the requirements of financial reporting and M&A practice. As a result you may wish to perform various sensitivity analyses on the potential fair value of the acquired reserves an example of which is included in the figure below.

Other assets and liabilities: Other assets and liabilities acquired that should be considered in performing purchase price allocations, include undeveloped acreage, acquired seismic (licensed or proprietary), assets retirement obligations, deferred income taxes and working capital. Financial reporting teams should coordinate with deal teams to identify any of these and other potential assets that need to be fair valued.

Reserve fair value - Discount rate sensitivity



Nuances in fair value accounting standards can make a difference

If your company is in the M&A market for unconventional resource plays such as shale gas, a third-party consultant with expertise in fair valuing acquired reserves for financial reporting purposes can be helpful in determining the proper approach. In addition, keep in mind the following nuances in the proper determination of fair value:

- The use of quoted commodity futures prices as of the closing date of the transaction
- The importance of involving financial reporting teams early in the process
- The importance of robust scenario and sensitivity analysis as an integral part of the internal and external communication process surrounding the prospective financial statement impacts of undertaking a particular deal
- Consideration of the nature of likely market participants (taxable/tax-advantaged) and its implication on establishing a market participant discount rate as well as incorporation of the tax attributes of acquiring the reserves including the incorporation of a tax depletion bonus
- Examining the overall business acquired to identify other potential assets/liabilities that may be required to be fair valued under financial reporting standards such as undeveloped acreage and seismic assets

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