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PLUS Energy Valuation Insights

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Our valuation opinions are well-reasoned and thoroughly documented, providing critical support for any potential engagement.

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Bridging Valuation Gaps for Undeveloped & Unproven Reserves

by Donald Erickson, ASA and Bryce Erickson, ASA, MRICS

The petroleum industry was one of the first major industries to widely adopt the discounted cash flow (DCF) method to value assets and projects—particularly oil and gas reserves. These techniques are generally accepted and understood in oil and gas circles to provide reasonable and accurate appraisals of hydrocarbon reserves. When market, operational, or geological uncertainties become challenging, such as in today's low price environment, the DCF can break down in light of marketplace realities and "gaps" in perceived values can appear.

While DCF techniques are generally reliable for proven developed reserves (PDPs), they do not always capture the uncertainties and opportunities associated with the proven undeveloped reserves (PUDs) and particularly are not representative of the less certain upside of possible and probable (P2 & P3) categories. The DCF's use of present value mathematics deters investment at low ends of pricing cycles. The reality of the marketplace, however, is often not so clear; sometimes it can be downright murky.

In the past, sophisticated acquirers accounted for PUDs upside and uncertainty by reducing expected returns from an industry weighted average cost of capital (WACC) or applying a judgmental reserve adjustments factor (RAF) to downward adjust reserves for risk. These techniques effectively increased the otherwise negative DCF value for an asset or project's upside associated with the PUDs and unproven reserves.

At times, market conditions can require buyers and sellers to reconsider methods used to evaluate and price an asset differently than in the past. In our opinion, such a time currently exists in the pricing cycle of oil reserves, in particular to PUDs and unproven reserves. In light of oil's low price environment, coupled with the forecasted future price deck, many, if not most, PUDs appear to have a negative DCF value.

Distressed Markets

In the past, we have analyzed actual market transactions to show that buyers pay for PUDs and unproven reserves despite a DCF that result in little or no value. In today's market, however, asset transactions of "non-core assets" indicate zero value for all categories of unproven reserves and PUDs. A highlighted example of this is Samson Oil and Gas's recent purchase of 41 net producing wells in the Williston Basin in North Dakota and Montana. The properties produce approximately 720 BOEPD, and contain estimated reserves of 9.5 million barrels of oil equivalent. Samson paid $16.5 million for the properties in early January 2016 and estimates that within five years they can fund the drilling of PUDs. Samson's adjusted reserve report, using the most current market commodity prices, indicated PDP reserves worth $15.5 million, PDNPs worth $1 million and PUDs worth $35 million—a total of $52 million in reserves present valued at 10%. This breakdown indicates dollar for dollar value was given on the PDP and PDNP reserves, but zero cash value given on the PUDs.

Is this transaction the best indication of fair market value or fair value?

We believe there is a convincing argument to be made that the Samson transaction and a handful of other asset deals in the previous six months are not the best indication of asset value. In short, these sales could be categorized as distressed or "fire sale" transactions for the following reasons:

- Significant decline and volatility in oil prices from (1) uncertain future demand and (2) current excess supply;
- Debt level pressures with (1) loan covenant requirements and (2) cash flow requirements; and
- The low deal volume environment as market participants have been in a "wait and see" stance since oil prices began declining over twelve months ago.

In this low price environment, buyers don't have to blink first. These factors indicate that some companies may feel pressure to lower their asking prices to levels that continuously attract bidders. The market looks distressed.

What does this mean for the E&P companies looking to reorganize under a Chapter 11 Bankruptcy?

Here are five key concepts for management teams and their advisors to be familiar with when embarking upon a Chapter 11 reorganization.

1. **Liquidation vs. Reorganization.** The proposed reorganization plan must establish a "reorganization value" that provides superior outcomes for shareholders relative to a Chapter 7 liquidation proceeding.
2. **Liquidation Value.** This premise of value assumes the sale of all of the company's assets within a short period of time. Different types of assets might be assigned different levels of discounts (or haircuts) based upon their ease of disposal.
3. **Reorganization Value.** As noted in ASC 852, Reorganizations, reorganization value "generally approximates the fair value of the entity before considering liabilities and approximates the amount a willing buyer would pay for the assets of the entity immediately after the restructuring." Reorganization values are typically based on discounted cash flow (DCF) analyses.
4. **Cash-Flow Test.** A cash-flow test examines the viability of a reorganization plan, and should be performed in order to determine the solvency of future operations. In practice, this test involves projecting future payments to creditors and other cash flow requirements including investments in working capital and capital expenditures.
5. **Fresh-Start Accounting.** Upon emergence from bankruptcy, fresh-start accounting may be required to allocate a portion of the reorganization value to specific identifiable intangible assets such as tradename, technology, or customer relationships. Fair value measurement of these assets typically requires use of the multi-period excess earnings method or other techniques often used in purchase price allocations following a business combination.

If recent market transactions are utilized to establish a Liquidation Value, then it stands to reason that very little, if any, value will be given to the PUD reserves. Additionally, under the definition of Reorganization Value, it is possible that significant value may arise from PUD reserves after the cash flow projections are adjusted for the new debt levels. This will provide two significant benefits: (1) more time and (2) possibly more cash. More time may allow the global oil and gas prices to increase while the additional cash flow may allow investment in future PUD wells. Each of these would improve cash flow in the future. Therefore, it is important to consider the all classification of reserves under the Reorganization Value scenario. While one valuation method will be a traditional DCF method, another valuation method to be considered is Option Pricing.

Option Pricing

If one solely relied on the market approach, it appears much of these unproven reserves would be deemed worthless. Why then, and under what circumstances, might the unproven reserves have significant value?

The answer lies within the optionality of a property's future DCF values. In particular, if the acquirer has a long time to

drill, one of two forces come into play: either (1) the current price outlook can change radically for a resource, and subsequently altering the PUDs or (2) drilling technology can change, such as the onslaught of hydraulic fracturing, and the unproven reserves accrue significant DCF value.

This optionality premium or valuation increment is typically most pronounced in unconventional resource play reserves, such as coal bed methane gas, heavy oil, or foreign reserves. This is additionally pronounced when the PUDs and unproven reserves are held by production. These types of reserves do not require investment within a fixed short timeframe.

Current Pricing Environment: Challenge = Opportunity

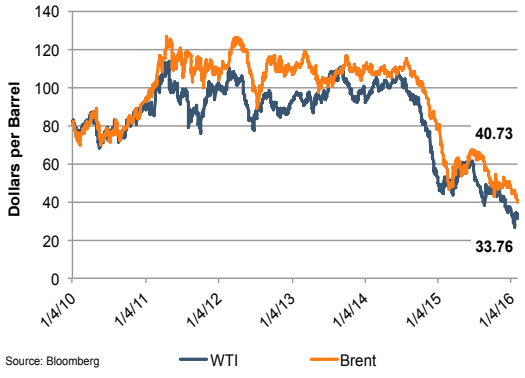
One of the primary challenges for industry participants when valuing and pricing oil and gas reserves is addressing PUDs and unproven reserves. As oil prices have dropped over 50% in the last six months, reaching twelve year lows, it should be anticipated that PUD values may drop from 75 cents on the dollar to 20 cents on the dollar or less. After the Great Recession, some PUDs faced a similar, yet more modest, decline in prices. The price level recovery for PUDs in 2011 was partly attributable to the recovery in the U.S. and global economies, and partly due to increases in the price of oil.

Five main factors have significantly increased the world supply of oil and driven down prices:

1. The continued success of shale drillers in the U.S.
2. OPEC's choice to increase and hold production levels.
3. The U.S.'s elimination of restrictions on crude oil exports.
4. The recent lifting of Iran's sanctions and the anticipation of additional supply from war-torn countries of Libya and Iraq.
5. Oil consumption slowing down in countries like China.

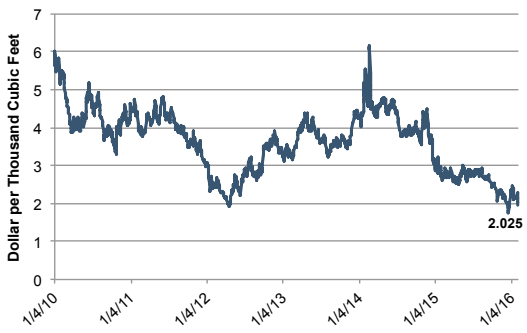
Saudi Arabia and the nations of OPEC met on April 17th to discuss a production freeze, but were unable to agree to a deal since Iran would not join the discussion. If the deal had been approved, it would have been the first deal between OPEC and non-OPEC members in 15 years. Iran, however, said that it would not freeze production until it reached pre-sanction levels of production of four million bpd. Iran's production is estimated to rise to 3.4 million bpd by mid-2016 and 3.5 million bpd by the end of 2016. A production freeze will be discussed again on June 2nd at the next OPEC meeting. This will delay crude oil supply and demand from rebalancing in 2016. Now, the question is when will oil prices recover? The Chief of the IEA estimated that oil prices will recover

Crude Oil Historic Prices



Source: Bloomberg

Natural Gas Historic Prices



Source: Bloomberg

in 2017. Prices are predicted to remain low in 2016 as expected demand for oil is growing at lower rates than in the past thanks to economic slowdowns in China, India, and Europe. However, the growth in oil supply is predicted to slow in 2017 as the current cuts in research and development catch up with many exploration and production companies. We must also remind ourselves of the crash in oil prices in 1985 that remained below $20 until 2003.

As previously mentioned, PUDs are typically valued using the same DCF model as proven producing reserves after adding in an estimate for the capital costs (capital expenditures) to drill. Then the pricing level is adjusted for the incremental risk and the uncertainty of drilling "success," i.e., commercial volumes, life and risk of excessive water volumes, etc. This incremental risk could be accounted for with either a higher discount rate in the DCF, a RAF or a haircut. Historically, in a similar oil price environment as we face today, a raw DCF would suggest little or no value for the PUDs or unproven reserves. Interestingly, market transactions with similar reserves (i.e., with little or no proven producing reserves) have demonstrated significant amounts attributable to non-producing reserves, thus demonstrating the marketplace's recognition of this optionality upside.

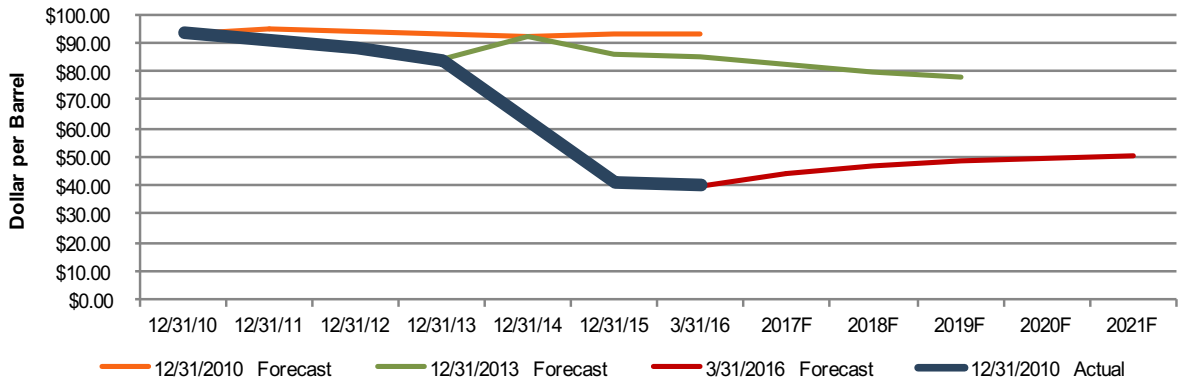
Studies have shown that NYMEX futures are not a very accurate predictor of the future, and yet buyers are estimating the value of this option into the prices they are willing to pay. When NYMEX forecasts $35 per barrel it could actually be $45.00 when that future date rolls around.

So what actions do acquirers take when values are out of the money in terms of drilling economic wells? Why do acquirers still pay for the non-producing and seemingly unprofitable acreage? Experienced dealmakers realize that the NYMEX future projections amount to informed speculation by analysts and economists which many times vary widely from actual results. Note in the chart above how much the future forecasted prices changed in only one year.

Real Options: Valuation Framework

In practice, undeveloped acreage ownership functions as an option for reserve owners; therefore an option pricing model can be a realistic way to guide a prospective acquirer or valuation expert to the appropriate segment of market pricing for undeveloped acreage. This is especially true at the bottom of the historic pricing range occurring for the natural gas commodity currently. This technique is not a new concept as several papers have been written on this premise. Articles on this subject were written as far back as 1988 or perhaps further, and some have been presented at international seminars.

NYMEX WTI Futures



Source: Bloomberg

Comparative Inputs

Call Option on Share of Stock		Proven Undeveloped Reserve (PUD)
Underlying share price	→	DCF value of reserve when developed
Strike price	→	Capex needed to develop reserve
Time to expiration	→	Time remaining on mineral lease
Dividend	→	Value decay resulting from waiting
Time value of money	→	Time value of money
Volatility of share price	→	Volatility of developed reserve value
	↓	
In-the-money value	→	NPV of project

The PUD and unproved valuation model is typically seen as an adaptation of the Black Scholes option model. An applicability signal for this method is when the owners of the PUDs have the opportunity, but not the requirement, to drill the PUD and unproven wells and the time periods are long, (i.e. five to 10 years). The value of the PUDs thus includes both a DCF value, if applicable, plus the optionality of the upside driven by potentially higher future commodity prices and other factors. The comparative inputs, viewed as a real option, are shown in table above.

Pitfalls & Fine Print

There are, of course, key differences in PUD optionality and stock options as well as limitations to the model. Amid its usefulness, the model can be challenging to implement. Below are some areas in particular where keen rigorous analysis can be critical:

- **Observable Market.** Unlike a common stock, there is no direct observable market price for PUDs. The inherent value of a PUD is the present value of a series of cash flows or market pricing for proven reserves, if available. All commodity prices are volatile, but oil and gas prices are more volatile than most since they have both year to year supply and demand changes in addition to significant seasonal swings.
- **Risk Quantification.** We have found that oil and gas price volatility benchmarks (such as long term index volatilities) are not all-encompassing risk proxies when valuing specific oil and gas assets. If not analyzed carefully, the model can sometimes have trouble capturing some critical production profile and geologic risks that could affect future cash flow streams considerably. Risks can include items such as (1) production profile assumptions; (2) acreage spacing; (3) localized pricing versus a benchmark (such as Henry Hub or West Texas Intermediate Crude); and (4) statistical "tail risk" in the assumed distribution of price movements.
- **Sensitivity to Capital Expenditure Assumptions.** Underlying analysis of an asset or a project's economics can present particular sensitivity to assumed capital expenditure costs. In assessing capital expenditure's role as both (1) a cash flow input and (2) an option model input, estimations of future costs can be very acute, yet challenging, assumptions to properly measure.
- **Time to Expiration**. This input can require granular analysis of field production life estimates coupled with expiring acreage, then filtered within the drilling plans of an operator. The resulting weighted time estimate can present problems with assumption certainty.

The availability of drilling resources tends to rise while the costs of drilling and oilfield services tend to fall, often precipitously, when oil and gas prices fall. These factors can present an oscillating delta in both cost and timing uncertainties as the marketplace responds by investing capital into underdeveloped reserves while the fuse burns on existing lease rights. The time value of an option can increase significantly if (1) the mineral rights are owned; (2) unconventional resource play reserves are included; (3) there are foreign reserves; or (4) the reserves are held by production. In these instances, the PUD and unproved reserve option to drill can be deferred over many years, thereby extending the option.

Summary

Utilization of modified option theory is not in the conventional vocabulary among many oil patch dealmakers, but the concept is considered among E&P executives as well as transactions in non-distressed markets. This application of option modeling becomes most relevant near the bottom of historic cycles for a commodity. If the right to drill can be postponed for an extended period of time, (i.e. five to ten years), the time value of the out-of-the-money drilling opportunities can have significant worth in the marketplace.

We caution, however, that there are limitations in the model's effectiveness. Black Sholes' inputs do not always capture some of the inherent risks that must be considered in proper valuation efforts. Specific and careful applications of assumptions are musts. Nevertheless, option pricing can be a valuable tool if wielded with knowledge, skill, and good information, providing an additional lens to peer into a sometimes murky marketplace. Such an environment exists currently with many companies facing bankruptcy. Establishing reasonable and supportable evidence for PUD, probable and possible reserve values may assist in a reorganization process.

Mercer Capital has significant experience valuing assets and companies in the energy industry, primarily oil and gas, bio fuels and other minerals. Contact a Mercer Capital professional today to discuss your valuation needs in confidence.

ENERGY VALUATION INSIGHTS BLOG

M&A Activity in the Bakken

In order to survive, when producing is no longer economically feasible, production companies are selling "non-core" assets to generate the cash. M&A activity of Bakken assets has slowed in 2016, but most Bakken assets are selling for heavy discounts making them attractive to buyers. This posts discusses some of these transactions in light of the current environment.

Read Post at **mer.cr/2914YZi**

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Energy Valuation Insights Blog

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Royalty Interests: First in Line, Last in Conversation

by Grant M. Farrell, ASA, CPA, ABV, CFF

When the price of oil started its descent during 2014, the majority of media attention was, and still is, focused on exploration, production, and oil field services companies. While bankruptcy courts are busy deciphering reorganization plans and perhaps liquidations of companies, one group of oil and gas participants are getting little attention: royalty owners. While the last two years have been a rough ride, opportunities do exists for forward thinking royalty owners and investors.

Although they are first to receive money from production, for the most part, royalty owners have been left to fend for themselves during this commodity price downturn. The lucky ones, holding their breath hoping their operator doesn't go bankrupt, watched their monthly distributions fall to fractions of their 2014 payments. The unlucky ones haven't seen a payment in months only to learn through media sources that their operator entered bankruptcy. When this situation occurs, many questions surface:

- What will happen to my royalty payments?
- What will happen to the lease contract?
- What legal action should I take?

While Mercer Capital does not provide legal advice we can provide guidance on valuing royalty interests in the current environment. For some guidance on the legal questions, refer to the the first end note.

Each of the questions above indicates uncertainty. As uncertainty increases, risk increases as well. As risk increases, the value of a given asset declines. But let us back up. When understanding the value of a royalty interest, it is important to understand its origin and its financial features.

Origin

Royalties typically originate from an agreement between a land owner and an exploration and production (E&P) company. E&P companies that approach the owners of the property where they seek to drill wells, have two options: (1) purchase the land from the current owner; or (2) acquire the rights to drill and produce. Option two is typically cheaper, initially. The monetary components of a contract between the land owner and the E&P company is usually comprised of two components: (1) an up-front cash payment (commonly referred to as a lease bonus); and (2) a royalty interest in all future wells on the property.

Financial Features

The financial features of a **royalty interest** are best described in the definition of a royalty as follows: Ownership of a percentage of **production** or production revenues, produced from leased acreage. The owner of this share of production does not bear any of the cost of **exploration**, drilling, producing, operating, marketing, or any other expense associated with drilling and producing an oil and **gas well**.[1]

Generally, royalty payments are made on a monthly basis for the production generated in the prior month. As the definition above indicates, royalty interests are not exposed to the costs of drilling, producing, or operating the well. In simplified terms, there are three main inputs driving the monthly royalty payment: (1) commodity price; (2) monthly production; and (3) royalty interest percentage. Royalty interest percentage typically will stay the same throughout the contract life, unless amendments are made. Therefore, any changes in the paystub come from changes in commodity price and production levels.

Valuation of a Royalty Interest

As the financial features suggest, valuation of a royalty interest can be a straight forward exercise for an experienced professional with knowledge of the nuances. Typically there are two methods used to estimate the value of a royalty trust: (1) income approach and (2) market approach.

Income Approach

A discounted cash flow analysis is based on the theory that the value of any investment is equal to the present value of its expected future economic benefit stream. In order to calculate the value one must project the future expected cash flows and discounts them back at an appropriate discount rate. Expected cash flows must project both anticipated production of the resource and anticipated prices for the resource. However, a discounted cash flow analysis is only as good as its inputs and as we discussed in **a blog post** on ***Energy Valuation Insights***, NYMEX future prices are no more than informed speculation. Thus the discount rate must appropriately compensate for the risk.

MERCER CAPITAL

Oil & Gas Experience

Mercer Capital has over 20 years experience valuing assets and companies in the oil and gas industry. These companies include large and small exploration and production firms ("E & P") with assets less than $100 million dollars to multi-billion dollar transactions.

We have valued companies and minority interests in companies servicing the E&P industry. These include seismic, pipeline, storage, tool manufacturers, companies, etc.

An important part of many of these company valuations are the underlying assets: primarily the oil and gas reserves, i.e. proven producing, proven undeveloped, probables, possibles and raw acreage including both working interests and royalty rights.

We have valued billions of dollars worth of reserves over our careers and have one of the most active valuation practices in America in this arena.

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Market Approach

Another method used to calculate the value of a royalty interest utilizes market transactions of royalty interests in similar oil and gas resource plays. This can be done in two ways: (1) observing direct transactions of royalty interests; and (2) publicly traded royalty trusts.

As a primer for O&G royalty trusts, these trusts hold various royalty and net profit interests in wells operated by large exploration & production companies. These trusts have little in the way of operating expenses, have defined termination dates, and can be an investment to provide exposure to oil and gas prices. This **Motley Fool article**, from 2014, explains the pros and cons of investing in this sort of vehicle.

Figure 1: Public Royalty Trusts

Royalty Trust	Ticker	Market Cap $M	Price to Revenue	Current Yield	Implied Payback Period (Yrs)
Permian Basin Royalty Trust	NYSE:PBT	$309	19.1x	7%	13.8
Mesa Royalty Trust	MTR	$18	14.5x	8%	12.3
Sabine Royalty Trust	SBR	$536	14.7x	4%	22.8
VOC Energy Trust	VOC	$57	9.4x	12%	8.1
SandRidge Permian Trust	PER	$133	3.6x	59%	1.7
SandRidge Mississippian Trust I	SDT	$55	5.2x	64%	1.6
Sandridge Mississippian Trust II	NYSE:SDR	$81	3.5x	58%	1.7
San Juan Basin Royalty Trust	SJT	$303	21.0x	5%	19.5
Hugoton Royalty Trust	HGT	$93	31.9x	0%	205.3
Enduro Royalty Trust	NDRO	$119	9.5x	5%	19.2
Cross Timbers Royalty Trust	CRT	$113	13.6x	3%	28.9
MV Oil Trust	MVO	$68	9.7x	13%	7.8
Chesapeake Granite Wash Trust	CHKR	$98	5.4x	8%	13.0
Whiting USA Trust II	WHZT	$13	6.2x	0%	n/a
ECA Marcellus Trust I	ECT	$37	8.1x	13%	7.5
Pacific Coast Oil Trust	ROYT	$63	12.5x	0%	n/a
BP Prudhoe Bay Royalty Trust	BPT	$352	5.7x	23%	4.4
Average		**$144**	**11.4x**	**17%**	**24.5**

Figure 2: Average Metric Comparison

Jul-2016	Average Metrics	Jul-2015
11.4x	**Price: Revenue**	13.3x
12.2x	**Price: Distributble Income**	13.8x
17%	**Pre-tax Distribution Yield**	27%
1.8x	**Price: PV-10***	0.8x
$41.54	**WTI Spot Price**	$47.11
$45.90	**WTI 1 Year Futures**	$51.49
$2.97	**Henry Hub Spot Price**	$2.76
$3.07	**Henry Hub 1 Year Futures**	$2.97

* PV-10 is as of most recent year end

Market indications are available in the form of publicly traded oil & gas ("O&G") royalty trusts. There are approximately 17 oil and gas focused royalty trusts publicly traded, as of the date of this article (Figure 1).

Market Observations

Royalty trusts, like the rest of the oil and gas industry, have been hit hard as the price of oil fell. Here is a comparison of the 17 publicly traded royalty trusts' metrics today versus one year ago (Figure 2).

Observations and disclaimers:

1. Price to revenue and price to distributable income indicate, on average, the trusts are cheaper now than a year ago.

2. Yields were higher last year as trailing yields had not caught up to the quickly falling market price (from August 2014 to July 2015, the group was down 40% to 60%).

3. Market prices have leveled off and yields have had a chance to catch up, resulting in lower yields compared to a year ago.

4. Price to PV 10 is higher this year compared to last, primarily the result of timing differences between the releases of reserve reports (end of fiscal year, which for most is calendar year) the mid-year date we captured and the market price.

5. The remaining observations are for commodity prices, both current and futures contract for the 12 month.

6. Disclaimer: no two of the above royalty trusts are alike. Differences abound in asset mix, asset location, term, resource mix, just to name a few. In future blog posts, we will explore each trust individually and discuss their uniqueness.

The next page contains a chart of the market price performance for each royalty trust over the last two years.

Figure 3: Royalty Trust Performance (Last 2 years)

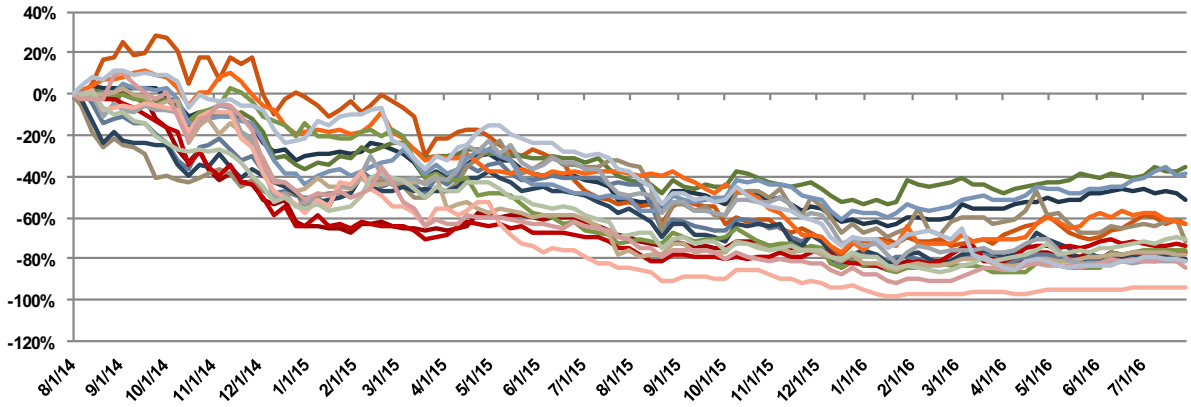
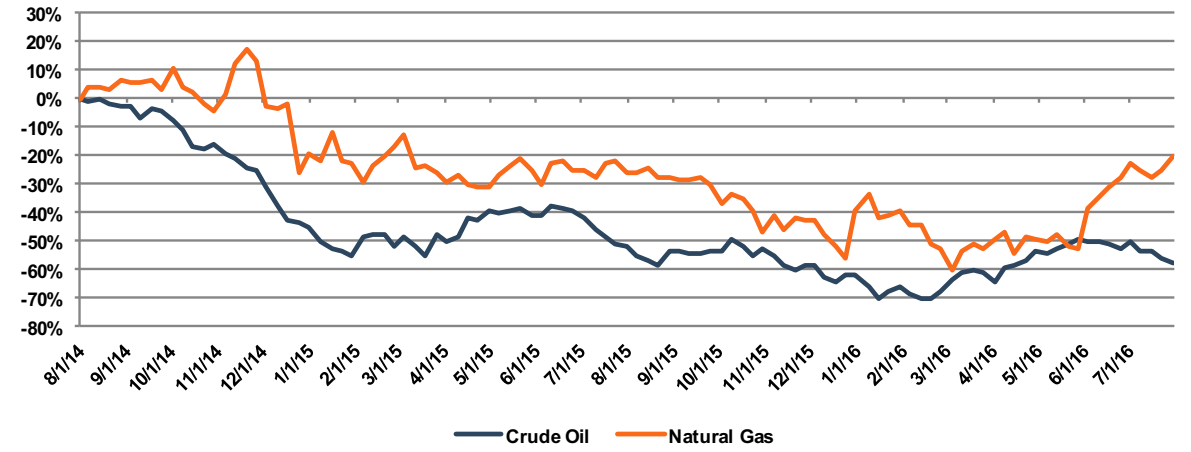


Figure 4: Crude Oil and Natural Gas Performance (Last 2 Years)



The chart looks very similar to the performance of the price of oil and gas over the same time period. Royalty interest owners have seen their monthly payments move in the same manner, and possibly have not experienced the small rebound over the first six months of 2016.

Uncertainty is high as operators have been forced to file bankruptcy after commodity prices have remained low for too long for them to survive. Depending on your situation, the current pricing environment may provide excellent planning opportunities as market prices are relatively low. With the **Treasury Department** attempting to change the way gift and estate planning can be performed, it is even more timely to execute a transfer plan. Contact Mercer Capital to discuss your needs in confidence and learn more about how we can help you succeed.

End Note

[1] See the article, "**Protecting Oil & Gas Royalties in the Event of Bankruptcy**" from the *Dallas Bar Association* on the topic or the article, "**Bankruptcy In The Oil Patch**" by the *Oil and Gas Financial Journal.*

Necessary Chapter 11 Process Navigation

by Travis W. Harms, CFA, CPA/ABV, and Sujan Rajbhandary, CFA

Chapter 11 reorganization affords a financially distressed or insolvent company an opportunity to restructure its liabilities and emerge as a sustainable going concern. Once a petition for Chapter 11 is filed with the bankruptcy court, the company usually undertakes a strategic review of its operations, including opportunities to shed assets or even lines of businesses. During the reorganization proceeding, stakeholders, including creditors and equity holders, negotiate and litigate to establish economic interests in the emerging entity. The Chapter 11 reorganization process concludes when the bankruptcy court confirms a reorganization plan which specifies a reorganization value and which reflects the agreed upon strategic direction and capital structure of the emerging entity.

In addition to fulfilling technical requirements of the bankruptcy code and providing adequate disclosure, two characteristics of a reorganization plan are germane from a valuation perspective:[1]

» The plan should demonstrate that the economic outcomes for the consenting stakeholders are superior under the Chapter 11 proceeding compared to a Chapter 7 proceeding, which provides for a liquidation of the business.

» Upon confirmation by the bankruptcy court, the plan will not likely result in liquidation or further reorganization.

Within this context, valuation specialists can provide useful financial advice in order to:

» Establish the value of the business under a Chapter 7 liquidation premise.

» Measure the reorganization value of a business, which oulines both the haircuts required of pre-bankruptcy stakeholders and the capital structure of the emerging entity. A reorganization plan confirmed by a bankruptcy court establishes a reorganization value that exceeds the value of the company under a liquidation premise.

» Demonstrate the viability of the emerging entity's proposed capital structure, including debt amounts and terms given the stream of cash-flows that can be reasonably expected from the business.

Liquidation Value

The value of a business under the liquidation premise contemplates a sale of the company's assets within a

short period. Inadequate time to place the assets in the open market means that the price obtained is usually lower than the fair market value.

In general, the discount from fair market value implied by the price obtainable under a liquidation premise is directly related to the liquidity of an asset. Accordingly, valuation analysts often segregate the assets of the petitioner company into several categories based upon the ease of disposal. Liquidation value is estimated for each category by referencing available discount benchmarks. For example, no haircut would apply to cash and equivalents while real estate holdings would likely incur potentially significant discounts, which could be estimated by analyzing the prices commanded by comparable properties under a similarly distressed sale scenario.

Reorganization Value

ASC 852 defines[2] reorganization value as:

> *"The value attributable to the reconstituted entity, as well as the expected net realizable value of those assets that will be disposed of before reconstitution occurs. This value is viewed as the value of the entity before considering liabilities and approximates the amount a willing buyer would pay for the assets of the entity immediately after restructuring."*

Reorganization value is generally understood to be the value of the entity that emerges from the bankruptcy proceeding under a going concern premise of value. Typically, the largest element of the reorganization value is the business enterprise value of the emerging entity. Reorganization plans primarily make use of the discounted cash-flow (DCF) method under the income approach to measure the business enterprise value of the emerging entity. The DCF method estimates the net present value of future cash-flows that the emerging entity is expected to generate. Implementing the discounted cash-flow methodology requires three basic elements:

1. **Forecast of Expected Future Cash-flows.** Guidance from management can be critical in developing a supportable cash-flow forecast. Generally, valuation specialists develop cash-flow forecasts for discrete periods that may range from three to ten years. Conceptually, one would forecast discrete cash-flows for as many periods as necessary until a stabilized cash-flow stream can be anticipated. Due to the opportunity to make broad strategic changes as part of the reorganization process, cash-flows from the emerging entity must be projected for the period when the company expects to execute its restructuring and transition plans. Major drivers of the cash-flow forecast include projected revenue, gross margins, operating costs and capital expenditure requirements. Historical experience of the petitioner company, as well as information from publicly traded companies operating in similar lines of business can provide reference points to evaluate each element of the cash-flow forecast.

2. **Terminal Value.** The terminal value captures the value of all cash-flows beyond the discrete forecast period. Terminal value is typically determined by capitalizing cash-flow at the end of the forecast period, based on assumptions about long-term cash-flow growth rate and the discount rate. In some cases, the terminal value may be estimated through the application of current or projected market multiples.

3. **Discount Rate.** The discount rate is used to estimate the present value of the forecasted cash-flows. Valuation analysts develop a suitable discount rate using assumptions about the costs of equity and debt capital, and the capital structure of the emerging entity. Costs of equity capital are usually estimated by utilizing a build-up method that uses the long-term risk-free rate, equity premia, and other industry or company-specific factors as inputs. The cost of debt capital and the likely capital structure may be based on benchmark rates on similar issues and the structures of comparable companies. Overall, the discount rate should reasonably reflect the business and financial risks associated with the expected cash-flows of the emerging entity.

The sum of the present values of all the forecasted cash-flows, including discrete period cash-flows and the terminal value, provides an indication of the business enterprise value of the emerging entity for a specific

set of forecast assumptions. The reorganization value is the sum of the expected business enterprise value of the emerging entity, plus proceeds from the sale or other disposal of assets during the reorganization, if any. During the reorganization proceeding, different stakeholders may independently develop distinct estimates of the reorganization value to facilitate negotiations or litigations. The confirmed reorganization plan, however, reflects the terms agreed upon by the consenting stakeholders and specifies either a single range of reorganization values or a single point estimate.

Bankruptcy courts may permit certain post petition liabilities to facilitate the operation of the petitioning business during the reorganization process. In conjunction with the reorganization plan, the courts also approve the amounts of allowed claims or interests for the stakeholders (creditors or equity holders) in the restructuring entity. The reorganization value is the value of the total assets of the emerging entity and represents all of the resources available to meet the post petition liabilities, and allowed claims and interests called for in the confirmed reorganization plan.

Cash-Flow Test

In principle, a confirmed reorganization plan should not lead to a liquidation or further restructuring in the foreseeable future. A cash-flow test evaluates the viability of a reorganization plan following the conclusion of the restructuring under Chapter 11 protection.

The first step in conducting the cash-flow test is to identify the cash-flows that underpin the reorganization plan. Conceptually, these cash-flows are available to service all the obligations of the emerging entity. As a matter of practice, since the reorganization value is usually developed using the DCF method, establishing the appropriate stream of cash-flows is often straightforward. Valuation analysts then need to model the negotiated or litigated terms attributable to the creditors of the emerging entity. In practice, this involves projecting interest and principal payments to the creditors, including any amounts due to providers of short term, working capital facilities.

Finally, the cash-flow test also documents the impact of the net cash-flows on the balance sheet of the emerging entity. This entails modeling changes in the asset base of the company as portions of the expected cash-flows are invested in working capital and capital equipment, as well as changes in the debt obligations of and equity interests in the company as the remaining cash-flows are disbursed to the capital providers. A reorganization plan is generally considered viable if such a detailed cash-flow model indicates solvent operations for the foreseeable future.

Conclusion

Managers of companies going through a Chapter 11 restructuring process need to juggle an extraordinary set of additional responsibilities — evaluating alternate strategies, implementing new and difficult business plans, and negotiating with various stakeholders — while continuing to operate the business. For this reason, it is common for a company that has filed for Chapter 11 to seek help from outside third party specialists to formulate a reorganization plan that can facilitate a successful navigation through the bankruptcy court. Valuation specialists can provide useful advice and perspective during the negotiation of the reorganization plan. The specialists can also help prepare the valuation and financial analysis necessary to satisfy the requirements for a reorganization plan to be confirmed by a bankruptcy court.

End Notes

[1] Accounting Standards Codification Topic 852, Reorganizations ("ASC 852"). ASC 852-05-8.

[2] ASC 852-10-20.

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