Oil & Gas Global Cost Study

by BMO

West Texas Intermediate (WTI) crude oil prices have increased by more than 600% from a low of roughly US$11/bbl in December 1998 to US$84/bbl in September 2007. Henry Hub natural gas prices more than tripled, from approximately US$2/Mcf to US$7/Mcf.

Global petroleum product demand increased by roughly 10 million b/d from 76.1 million b/d in 1999 to approximately 86 million b/d in 2007

The dramatic increase in commodity prices has been driven principally by the surprisingly resilient growth in global petroleum product demand and the related shortfall in refining capacity. Global petroleum product demand increased by roughly 10 million b/d from 76.1 million b/d in 1999 to approximately 86 million b/d in 2007. Over the same period, however, non-OPEC supply increased by only half of that amount and refinery capacity has been virtually stagnant. This has handed more control of the global oil market to OPEC, which has attempted to maximize revenue by restraining production. Another factor that we believe has contributed to higher commodity prices is the remarkable increase in the cost of finding, developing and producing conventional oil and gas around the world over the last seven years.1 Worldwide finding and development costs (reserve replacement costs) have increased from US$4.09/boe in 1999 to US$14.53/boe in 2006 while worldwide production costs have expanded from US$3.58/boe in 1999 to US$8.11/boe. The net result is that the global oil and gas industry requires a significantly higher commodity price level in order to justify investment. If commodity prices are not high enough, investment will falter. We estimate that the price of WTI required in order to generate sufficient revenue to recover all of the costs incurred in finding, developing and producing a barrel of crude oil and/or natural gas on a worldwide basis has risen from US$16.99/boe in 1999 to US$58.66/boe in 2006,

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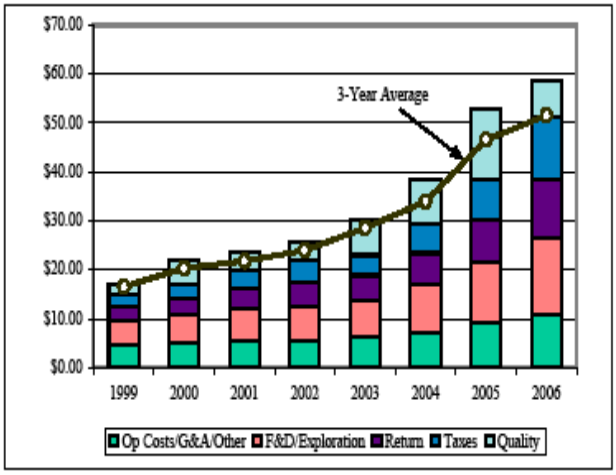
and will likely reach more than US$60/boe in 2007 based on the industry trends.

The report compiles the results for 178 companies with aggregate worldwide crude oil production of around 17.7 million b/d and worldwide natural gas production of approximately 76.5 Bcf/d.

Chart 1: Worldwide Required WTI Oil Price (US$/boe)



Source: BMO Capital Markets, Company Reports

Notes: Breakeven items, except F&D costs, exclude equity interest results for BP, RD, TOT and XOM; excludes Junior Producers and Trusts

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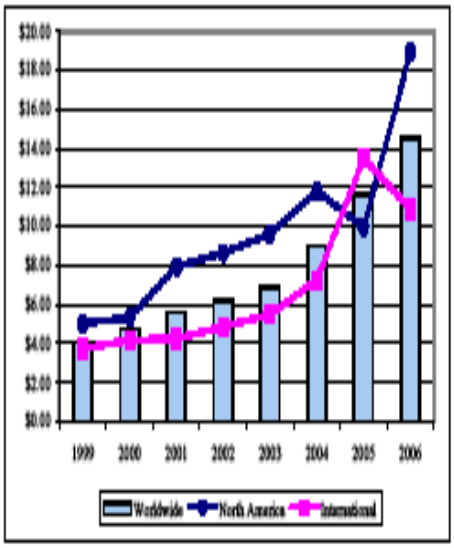
This study provides a global review of the oil and gas industry's cost structure based on the reported results of the Multi-National Oils as well as North American Integrateds, Senior Producers, Canadian Royalty Trusts and Junior Producers. The report compiles the results for 178 companies with aggregate worldwide crude oil production of around 17.7 million b/d and worldwide natural gas production of approximately 76.5 Bcf/d. We have translated the actual historical cost data (reserve replacement cost, production cost, G&A/other, income taxes) into "breakeven oil prices," which we define as the crude-oil equivalent price level that is required to recover all of the reported costs, including a 10% return on capital. We have also translated the breakeven oil price to a "required WTI price;" that is, the level at which WTI prices would need to be in order for the company to generate sufficient revenue to cover its costs, taking into consideration the quality of the product it produces relative to WTI. Worldwide finding and development costs (reserve replacement costs) have increased from US$4.09/boe in 1999 to US$14.53/boe in 2006,

while worldwide operating cost structure (including G&A/Other) has expanded from US$4.56/boe in 1999 to US$10.70/boe in 2006.

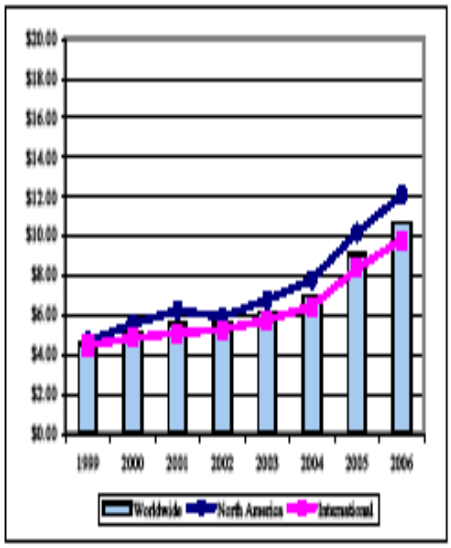
the average quality of crude oil has deteriorated slightly and the share of revenue captured by the resource owner (typically governments) has increased…..

Chart 2: Worldwide Reserve Replacement Costs (US$/boe)



Source: BMO Capital Markets, Company Reports
Notes: Excludes Junior Producers and Trusts

Chart 3: Worldwide Operating Costs (US$/boe)



Source: BMO Capital Markets, Company Reports
Notes: Includes Production and G&A/other costs; excludes Junior Producers and Trusts

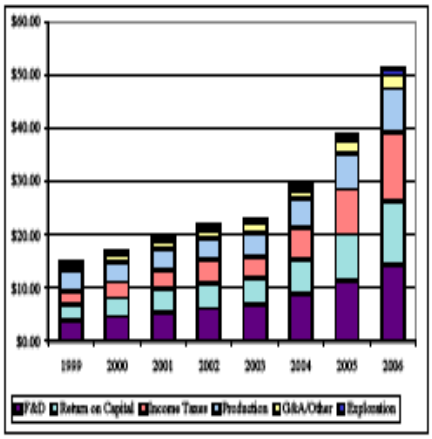
The net result is that the global oil and gas industry requires a significantly higher commodity price level in order to recover its costs, including a return on capital.

Other elements of the industry's cost structure, such as income taxes, have also increased, contributing to an increase in total costs from approximately US$15/boe in 1999 to US$51.34 in 2006 (Chart 4). At the same time, the average quality of crude oil has deteriorated slightly and the share of revenue captured by the resource owner (typically governments) has increased, which has resulted in revenue growth lagging the increase in commodity prices. As shown in Chart 5, the net revenue received by the industry has not kept pace with the increase in benchmark crude oil prices such as WTI. The net result is that the global oil and gas industry requires a significantly higher commodity price level in order to recover its costs, including a return on capital.

Our analysis suggests that the global oil and gas industry's breakeven oil price has risen from US$21.78/bbl in 2001 to US$51.55 in 2006. It appears headed to almost US$56, based on further cost pressures in 2007.

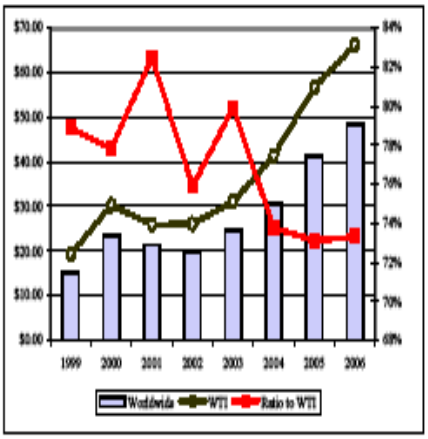
We believe these crude oil price levels likely represent a reasonable floor price for crude oil, all other things being equal.

Chart 4: Worldwide Cost Structure (US$/boe)



Source: BMO Capital Markets, Company Reports
Notes: Excludes Junior Producers and Trusts

Chart 5: Worldwide Net Revenue vs. WTI (US$/boe)



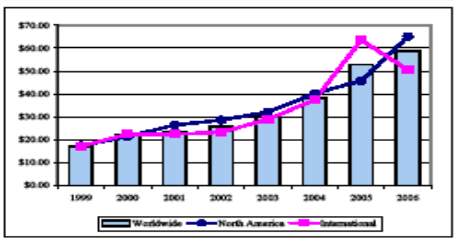
Source: BMO Capital Markets, Company Reports
Notes: Excludes Junior Producers and Trusts

We estimate that the price of WTI required in order to generate sufficient revenue to recover all of the costs incurred in finding, developing and producing a barrel of crude oil and/or natural gas on a worldwide basis has risen from US$16.99/boe in 1999 to US$58.66/boe in 2006 (Chart 6). However, the use of one-year reserve replacement costs likely overstates the price required in any individual year as capital spending and reserve additions tend to be lumpy. As a result, three or five-year weighted averages will likely be a better indicator of the industry's actual cost structure and required breakeven oil price. Chart 7 provides the estimated breakeven WTI price that is required in order to cover the industry's costs, including a return on capital, based on three-year average reserve replacement costs. Our analysis suggests that the global oil and gas industry's breakeven oil price has risen from US$21.78/bbl in 2001 to US$51.55 in 2006. It appears headed to almost US$56, based on further cost pressures in 2007. We believe these crude oil price levels likely represent a reasonable floor price for crude oil, all other things being equal.

Capital depreciation charges (DD&A) have steadily increased with rising reserve replacement costs

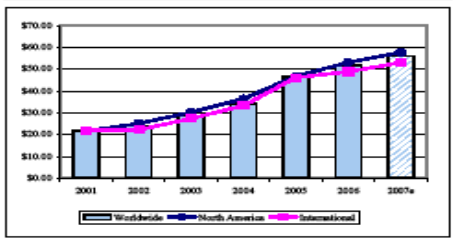
The dramatic increase in crude oil prices over the last six years from US$19.32 in 1999 to US$66.25 in 2006 has not necessarily translated to a "windfall" for the global oil and gas industry. As illustrated in Chart 8, the worldwide cash flow recycle ratio (cash flow from operations divided by reserve replacement costs) in 2006 was virtually unchanged from the level in 1999 despite an almost tripling in crude oil price levels, which suggests that full cycle returns on capital employed have not improved. Not surprisingly, capital depreciation charges (DD&A) have steadily increased with rising reserve replacement costs; however, as illustrated in Chart 9, DD&A charges have not kept pace with the rise in reserve replacement costs. This suggests that future capital depreciation charges may have to increase significantly if reserve replacement cost performance does not improve, which could materially impair future earnings and return on capital employed.

Chart 6: Worldwide Required WTI Oil Price One-Year (US$/boe)



Source: BMO Capital Markets, Company Reports
Notes: Excludes Junior Producers and Trusts

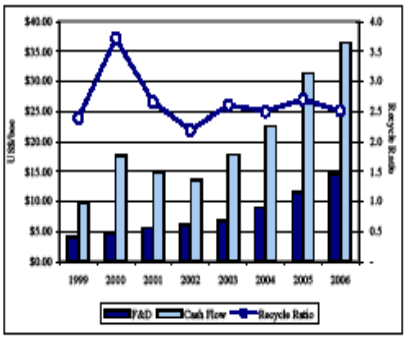
Chart 7: Worldwide Required WTI Oil Price Three-Year (US$/boe)



Source: BMO Capital Markets, Company Reports
Notes: Excludes Junior Producers and Trusts

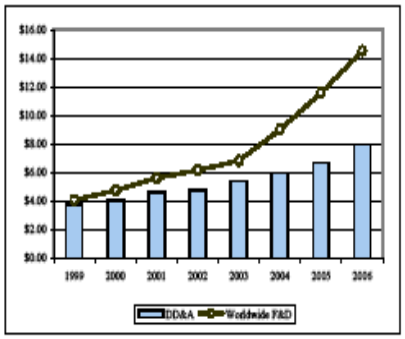
Chart 9, DD&A charges have not kept pace with the rise in reserve replacement costs.

Chart 8: Worldwide Cash Flow Recycle Ratio



Source: BMO Capital Markets, Company Reports
Notes: Operating earnings used as a proxy for Upstream cash flow; excludes Junior Producers and Trusts

Chart 9: Worldwide DD&A vs. F&D (US$/boe)



Source: BMO Capital Markets, Company Reports
Notes: Excludes Junior Producers and Trusts

As illustrated in Chart 10, the improvement in the industry's weighted average return on capital employed is significantly correlated with the increase in crude oil prices over the 1999 to 2006 period. It is noteworthy that the year-over-year improvement in return on capital employed stalled in 2006 despite the increase in crude oil prices due to the continued increase in the industry's cost structure. While we expect commodity prices to continue to move higher we do not envision the same dramatic increase that occurred since 1999. In contrast, however, we do believe that the industry's costs will continue to move higher, largely driven by the inexorable rise in reserve replacement costs that cannot be avoided because of the maturity of the basins globally. This could translate to lower returns on capital employed in future years and reduced valuation levels for the industry.

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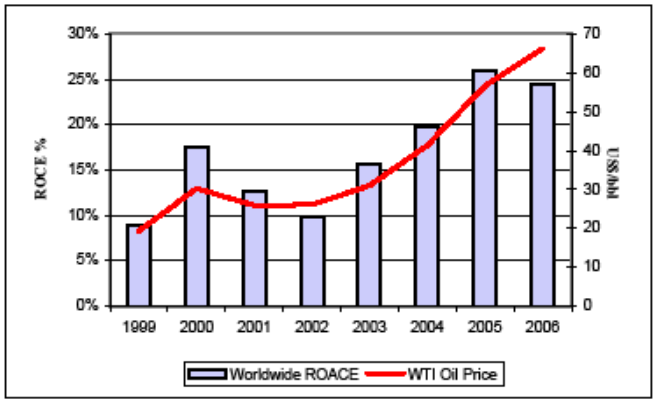
Chart 10: Return on Capital Employed vs. WTI Oil Price



Source: BMO Capital Markets, Company Reports

We continue to recommend an overall neutral investment posture toward the oil and gas group with a strong preference for companies that are leveraged to crude oil prices and refining fundamentals. The steady rise in the industry's cost structure could result in compressed operating margins and lower returns on capital employed in a flat-to-down commodity price environment. We believe that the Supermajors and Integrateds are better positioned to maintain or improve returns on capital employed and hence valuation multiples in this environment. In addition, based on the results of our study, companies that are focused on unconventional natural gas developments in North America should be able to sustain higher returns relative to their peers that are focused on conventional

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opportunities. Similarly, U.S. companies are positioned to outperform their Canadian counterparts in view of the cost difference between the two countries.

EnCana, Rider and Peyto Energy Trust delivered the lowest breakeven costs among the Canadian companies.