The Boston Company

Asset Management, LLC

A BNY MELLON COMPANY℠

July 2015

Battle for Barrels: Race to Lower Oil

When prices go up, everyone makes money; when they go down, there will be blood.

Prologue: A Paradigm Shift

Since China burst onto the commodity scene circa 2006, oil prices have staged two major rallies, only to be cut in half six months later. In between, the paradigm shifted, with U.S. unconventional oil fueling supply growth to the point of oversupply, more than making up for slack from the rest of the world, which has been struggling with civil unrest, corruption, sanctions and failed states, among other challenges.

It is hard to know the full extent of quality U.S. unconventional resources and the efficiency limits of recovering it, but momentum has been built enough to provide a half decade or more of on-demand growth.

Meanwhile, the rest of the world is starving assets for capital as they chase U.S. investments, forcing cost curves down everywhere else to compete for capital. As a result, production outside the U.S. is declining; for example, production in Mexico is down 11% year over year.

Although Iran is theoretically returning to the scene as a nuclear pact would end long-term sanctions on its exports, the country still faces many challenges. Even using the highest estimates, we believe Iran's production will amount to little more than a rounding error in a year or so. Its storage is a more immediate concern, with 17 million barrels on tankers ready to ship,* but that would create only a few months of headwinds at best.

Given this backdrop, we expect the U.S. to remain the central driver of supply growth. In this paper, we analyze the cost of U.S. unconventional oil production, as this will be the bar by which companies look to deploy capital, ultimately driving the longer-term price of oil.

How the Battle Begins

As evidenced by recent corporate activity, a drop in crude prices often spurs a race among oil-industry participants to lower their cost structures in an effort to defend profitability. This may be a matter of survival as these companies struggle to adjust to a new reality in which oil prices have less upside.

Robin Wehbé, CFA, CMT
Managing Director,
Portfolio Manager

* "Oil Market Report," International Energy Agency, June 11, 2015.

So what changed the game? In a word, fracking. This technology has spurred The North American energy revolution, unleashing surprisingly abundant energy resources from unconventional resources. Oil supply has moved to a just-in-time supply chain, suggesting that the pullback in oil prices is structural and prior highs above $100 a barrel are increasingly less relevant.

By contrast, the time to bring new supply to market in the U.S. has shortened dramatically — from six years to six months, in our estimation. This acceleration is a function of two dynamics:

1. Unconventional oil leverages historical conventional exploration (no dry holes).
2. The necessary infrastructure to extract, process and transport crude is already in place, as conventional oil has been produced in the U.S. since 1859, when Edwin Drake drilled the first oil well in Titusville, Pa.

Over the past decade, supply and demand have been roughly well balanced, even as fracking became more widespread. As illustrated by Exhibit 1, global supply managed to keep up with demand most of the time, until the summer of 2014. At that time, the industry reached the tipping point of oversupply, almost entirely driven by U.S. production. No other country has delivered such meaningful growth, placing the U.S. as the central player for incremental crude production.

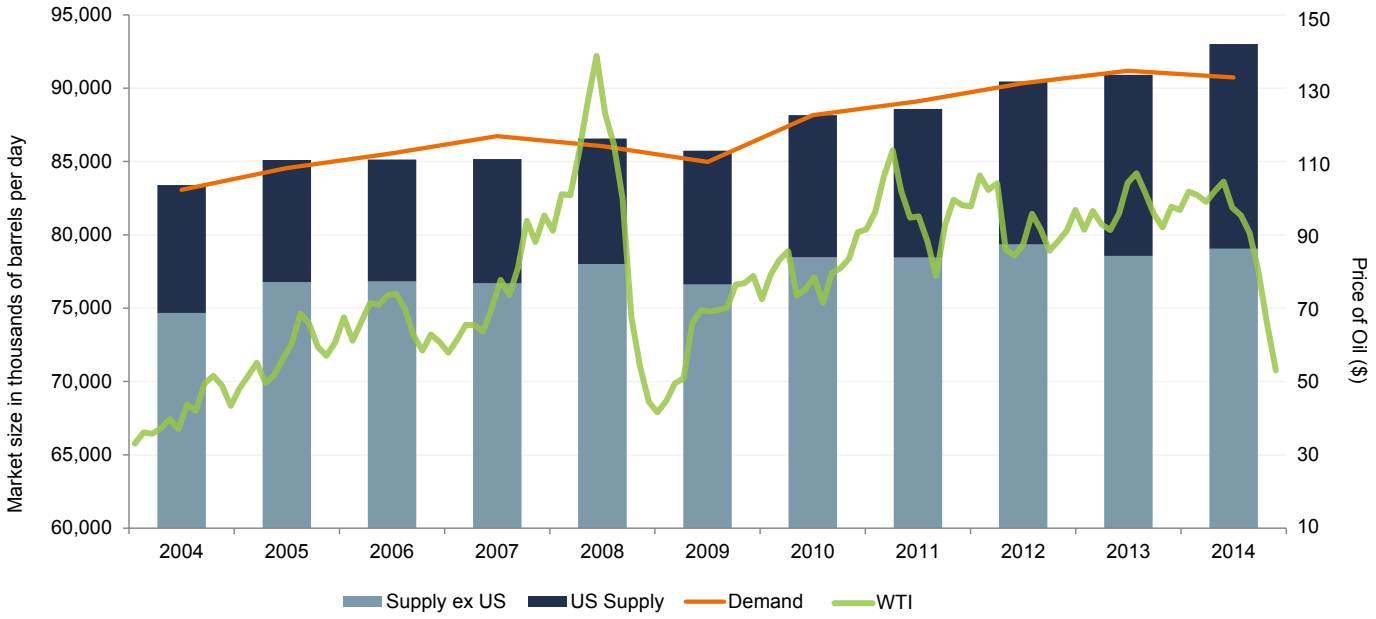
Over the past year, prices have fallen dramatically, and companies are trying to reduce their cost footprints. They have done this both organically through lowering overhead costs, cutting staff and fighting supplier pricing as well as non-organically through pursuing acquisitions to give them greater scale for synergies.

The Impact on Costs

This is inherently lowering the industry's cost curve and, in turn, the theoretical price for oil. If a company is able to maintain its profitability at lower commodity prices then it will continue to produce more oil, putting downward pressure on prices. We'll go through a hypothetical example of average North American Onshore Well Economics to illustrate this point. (Please see Exhibit 2.) Underlying assumptions include a static natural gas price of $2.50 and a revenue breakdown for each barrel of oil's components (U.S. averages) of 60% oil, 20% NGL and 20% gas.

The cost curve for oil breaks down into two major categories: Finding & Development (F&D, or "build the project"), and Lifting & Operating expenses (LOE, or "operate the project"). Before 2015, these categories added up to $30 per boe, plus an average 5% tax rate, which brings us to $32.50 in costs. Add in a required return of 15% and transport costs of $10, and the breakeven point is $47. At $70 a barrel companies were able to earn that 15% return and still have a cash margin of $2.15.

Exhibit 1: The Tipping Point of Supply and Demand



Source: Energy Information Administration, TBCAM data, Bloomberg

But, of course, things have changed, so we need to make different assumptions for the post-2015 calculations. Broadly we are seeing 20% cost savings on both F&D and LOEs, taking building and producing economics to $24 per boe. Factoring in the 5% average tax rate brings us to $25.80. Targeting a similar 15% return but a lower transport cost of $5 (as more pipes have come on, etc.), the breakeven is now at $35. Even with oil as low as $52 a barrel, companies are able to generate the same returns and thus grow supply.

Exhibit 2: Average North American Onshore Well Economics

Pre 2015			Post 2015		
F&D		$20.00	F&D		$16.00
LOE		$10.00	LOE		$8.00
Tax		5%	Tax		5%
		$32.50			$25.80
Return		15%	Return		15%
Transport		$10.00	Transport		$5.00
BE		$47.00	BE		$35.00
	Oil	**$70.00**		**Oil**	**$52.00**
	Gas	$2.50		Gas	$2.50
Rev/boe		$49.50	Rev/boe		$36.90
60%	Oil	$42.00	60%	Oil	$31.20
20%	NGL	$7.00	20%	NGL	$5.20
20%	Gas	$0.50	20%	Gas	$0.50
Cash Margin		**$2.15**	**Cash Margin**		**$2.18**

Source: TBCAM estimates

Given this, we believe that the industry will be able to absorb lower oil prices, supported by these deflationary cost pressures. As a result, oil prices may be under a ceiling indefinitely. Right now, we estimate a breakeven point of about $60 to $70 per barrel, depending on where wells are located, and oil prices could remain in this range for the rest of this decade.

Investing Implications

Investing in the Energy sector for this theme also requires a paradigm shift for market participants. Exploration & production companies (E&Ps) have frequently been viewed as a way to reap the benefit of the cash flow between the firms' costs and a rising commodity price. However, supply has changed that entire dynamic and companies will be unable to grow simply from higher commodity prices, causing intense competition in the segment for growth as the only other way to create value. As such E&Ps will advance any project over their cost of capital, leaving the industry to roughly break even at that level.

Instead, we view better risk/reward opportunities in companies that benefit from higher oil volumes more so than price, such as equipment and service suppliers, pipes and transportation, and even downstream refining and chemical companies. The just-in-time supply chain for oil has created the response speed to prevent major oil rallies, but it is still service- and capital-intensive and needs to get to market, providing enormous value-creation opportunities.

In fact, the world will be looking to the U.S. as the global solution for oil. Even if demand is stagnant (which we do not anticipate), oil wells naturally decline and need to be replaced. The shortened time horizon and lack of dry holes has massively de-risked oil investing, and capital from all over the world is focusing on U.S. resources. Recent history suggests that trend is already under way, as growth in upstream spending in North America has grown almost twice as fast as it has in the rest of the world, as shown in Exhibit 3.

Exhibit 3: Global Oil & Gas Upstream Spending *(in millions of dollars)*

	2009	2014	CAGR*
North America	107,316	234,376	16.9%
Outside North America	321,062	507,180	9.6%

*Compound annual growth rate

Source: Evercore ISI data

So while oil prices have truncated upside, and the traditional price-levered style of investing is irrelevant, enormous capital flows into US unconventional will favor companies participating in short-cycle investments, processing and delivery of oil, providing tailwinds for years to come.

About the Author

Robin Wehbé, CFA, CMT
Managing Director, Portfolio Manager

Robin is the lead portfolio manager of The Boston Company's Global Natural Resources and Global Independence strategies, which take a bottom-up macro approach to investing. He is also a senior research analyst on The Boston Company's Global Research team, covering the energy sector, and a member of the Global Insight team, a group of the firm's investment leaders.

In 2006, Robin joined The Boston Company as a global basic materials analyst. Since then, Robin has designed and launched the Global Natural Resources strategy in 2008, became the lead manager of the Dreyfus Natural Resources mutual fund in 2009, and launched the firm's long/short natural-resources strategy in addition to designing and launching the Global Independence strategy in 2013.

Before coming to the firm, Robin worked as a research analyst covering basic materials at State Street Global Advisors, where he began macro-focused investing in 2003 as part of the company's Global Strategy team.

He holds a B.S. from Lehigh University and an M.B.A. and an M.S.F. from the Carroll School of Management at Boston College. He holds both the Chartered Financial Analyst and the Chartered Market Technician designations. He is a member of the Boston Security Analysts Society and the Market Technicians Association.

本情報提供資料は、BNY メロン・グループ（BNY メロンを最終親会社とするグループの総称です）の資産運用会社が提供する情報について、BNY メロン・アセット・マネジメント・ジャパン株式会社が審査の上、掲載したものです。当資料は情報の提供を目的としたもので、勧誘を目的としたものではありません。当資料は信頼できると思われる情報に基づき作成されていますが、その正確性、完全性を保証するものではありません。ここに示された意見などは、作成時点での見解であり、事前の連絡無しに変更される事もあります。

BNY メロン・アセット・マネジメント・ジャパン株式会社
BNY Mellon Asset Management Japan Limited

金融商品取引業者：関東財務局長（金商）第 406 号
〔加入協会〕一般社団法人　投資信託協会
一般社団法人　日本投資顧問業協会