Swing Production and the Role of Credit:
A Synthesis of Best-in-Class Research

International Energy Forum and Bank of Canada Roundtable

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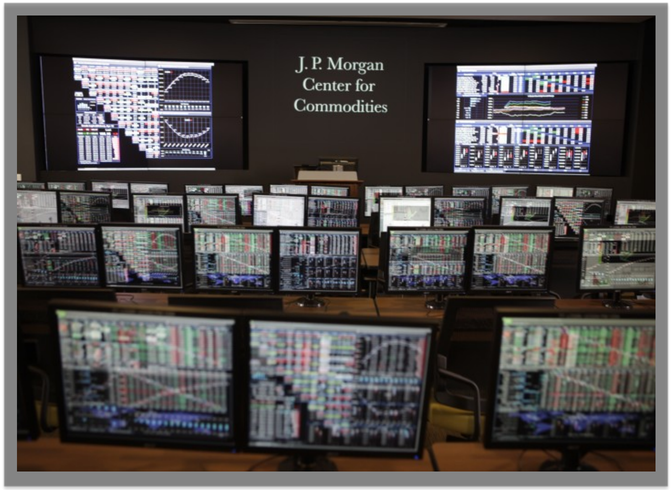
*Swing Production and the Role of Credit: A Synthesis of Best-in-Class Research **

I. Strict Definition of Swing Producer

II. New Technology: New Financing Options

III. Shale as an Imperfect Swing Producer, But Perhaps Only in the Short-Term Future



IV. Ultimately, the Gulf Producers, Though, Could Revert to Being the Key Swing Producers

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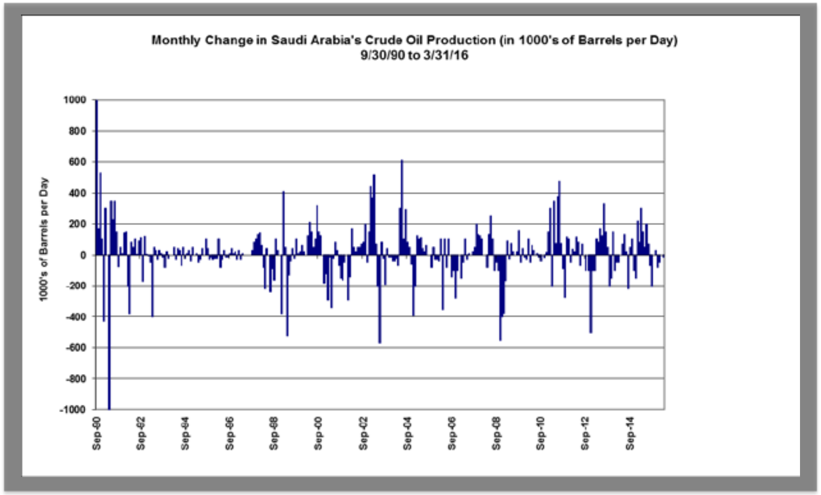
I. Strict Definition of Swing Producer

A. Definition of Swing Producer

Coy (2015): A swing producer "has a large market share, spare capacity, and very low production costs, and it is capable of acting strategically—alone or in a cartel—to raise and lower production to affect the price."

B. Historically, Gulf Producers Fit this Definition

<u>Capable of Acting Strategically</u>



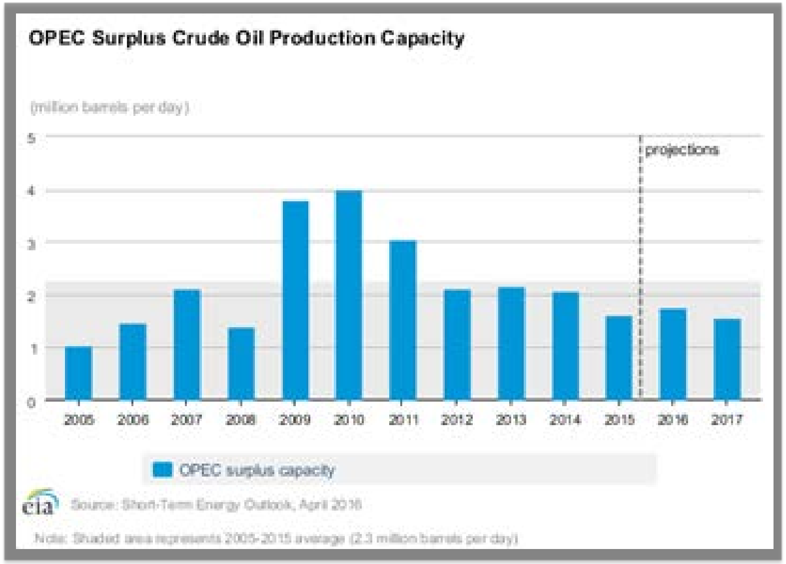
Source of Data: Bloomberg.

I. Strict Definition of Swing Producer

B. Historically, Gulf Producers Fit this Definition (Continued)

Spare Capacity

EIA (2014): The U.S. Energy Information Administration (EIA) has defined "spare capacity as the volume of production that can be brought on within 30 days and sustained for at least 90 days. … OPEC spare capacity has provided an indicator of the world oil market's ability to respond to potential crises that reduce oil supplies."



Source of Graphic: U.S. Energy Information Administration

Wall Street Journal (2016): "Saudi Arabia accounts for about two-thirds of the spare capacity" in crude oil.

I. Strict Definition of Swing Producer

B. Historically, Gulf Producers Fit this Definition (Continued)

<u>But At Least Not For Now</u>

It appears that for the time being, OPEC Gulf producers have shaken off their traditional role of balancing the oil market.

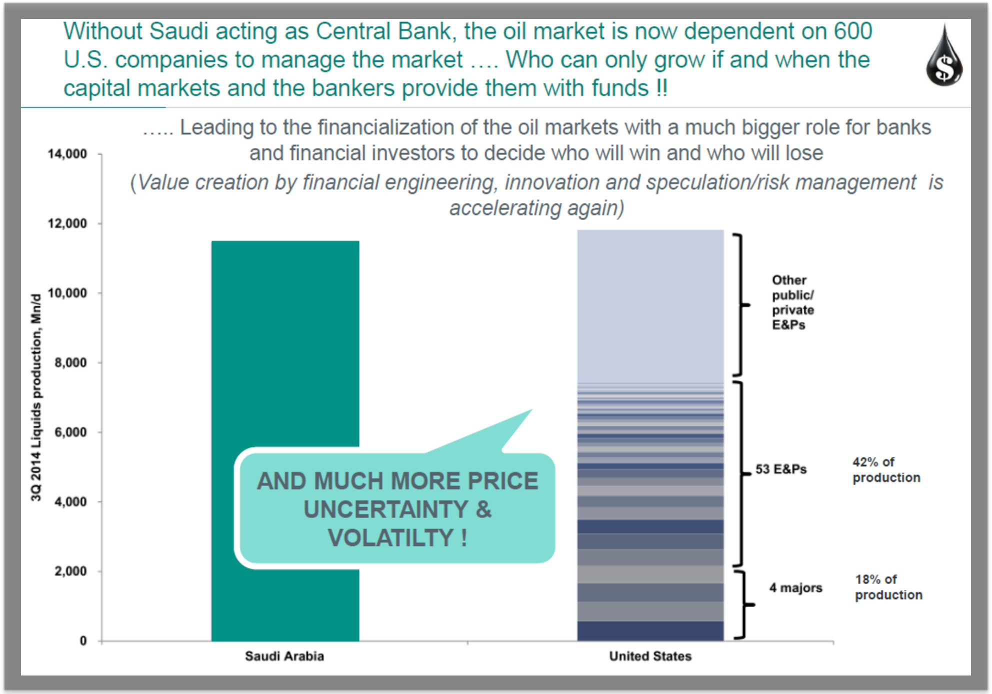
The Gulf oil producers had (until 2014) acted as the central banker of the oil market and had essentially provided a free put to the market-place in preventing a free fall in oil prices, even in the face of new oil production, particularly from the United States.

Arguably, one might compare the current price environment to 1986 when Saudi Arabia and other Gulf producers apparently decided upon prioritizing market share, according to Gately (1986).

Source: Till (2015).

I. Strict Definition of Swing Producer

C. Light Tight Oil (LTO) Producers Do Not Fit this Strict Definition



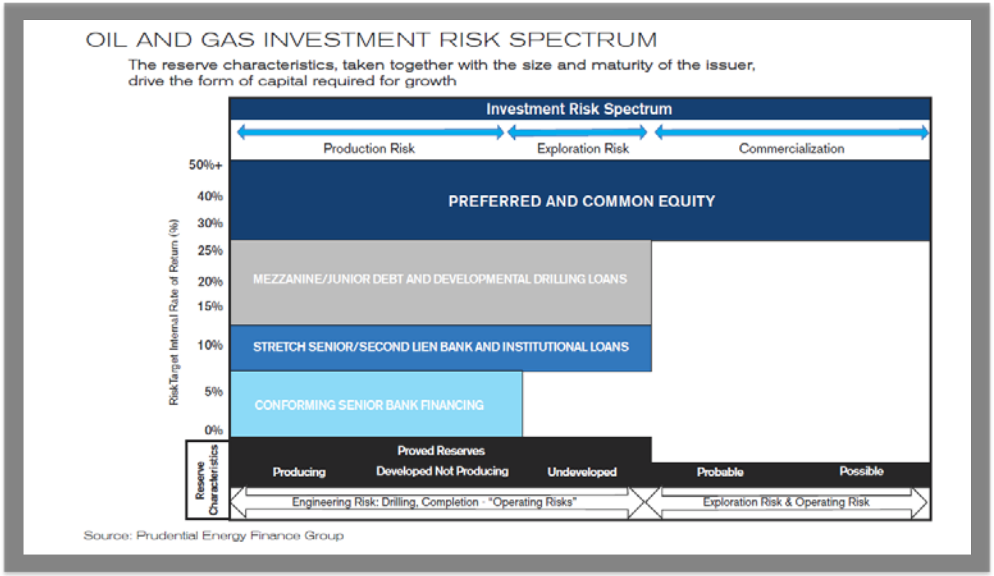
Source of Graphic: Jesse (2016), Slide 13, whom in turn cited Goldman Sachs.

Citi Research (2016, p. 2): "… U.S. production cannot be controlled by governments. It's the result of a competitive market with hundreds of companies and tens of thousands of investors making as many decisions."

II. New Technology: New Financing Solutions

A. Customizable Financing Solutions Became Available

With horizontal drilling and hydraulic fracturing, one can estimate the quantity of oil or gas that is potentially recoverable from a reserve or well, along with its initial production rate.



Source of Graphic: Clouser (2014), p. 11.

As long as one has a set of credible oil price forecasts across time, one can then value a shale company's oil reserves along with the size and timing of cash flows from production. This means that very customizable financing solutions became available in the development of shale oil projects.

II. New Technology: New Financing Solutions

A. Customizable Financing Solutions Became Available (Continued)

Reserves	Financing	Characteristics	
Proved Reserves	Sr. Secured/ Unsecured Fixed Rate Debt	Cash Flow, Covenant Based Lending Yield Range: 3.5% - 7.0% $10- $200 million Investment	
	Second Lien Fixed/ Floating Rate Debt	Coupon: 8% - 12% No royalty or equity linked component $10- $100 million Investment	
	Mezzanine	Targeted returns typically in the mid-to-high teens Contractual coupon with varying types of yield enhancing features (e.g., warrants, ORRI, NPI)	Secured / Unsecured $10- $50 million Investment
Probable & Possible Reserves	Equity	Non-Control Position Long Hold Period $10- $50 million Investment	

Source: Prudential Energy Finance Group

Source of Graphic: Clouser (2014), p. 13.

Abbreviations: ORRI stands for Overriding Royalty Interest, and NPI stands for Net Profits Interest.

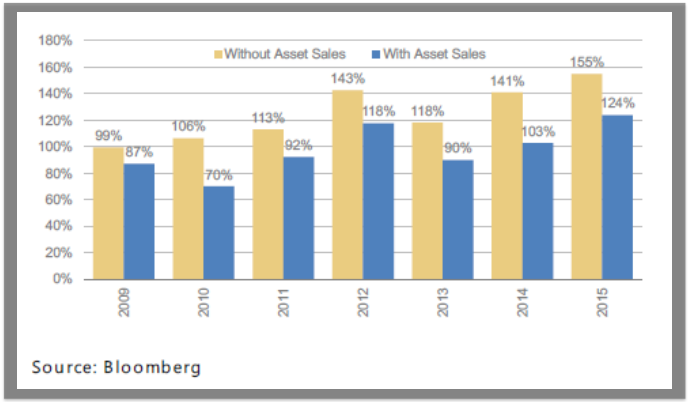
II. New Technology: New Financing Solutions

B. Distinguishing Between the Credit Cycle and the Commodity Cycle

Barclays Credit Research (2016, p. 1): "[W]e think investors need to distinguish between the commodity and credit cycles …"

<u>E&Ps Significantly Overspent Cash Flow</u>

Historical E&P Outspend (Capex as % of CF)



Source of Graphic: Morgan Stanley Research (2016), Exhibit 22.

Morgan Stanley Research (2016, p. 20): "Now, amid a prolonged cyclical trough, E&P balance sheets are stressed as credit, MLP, and asset markets have tightened and combined to force the industry toward cash flow neutrality."

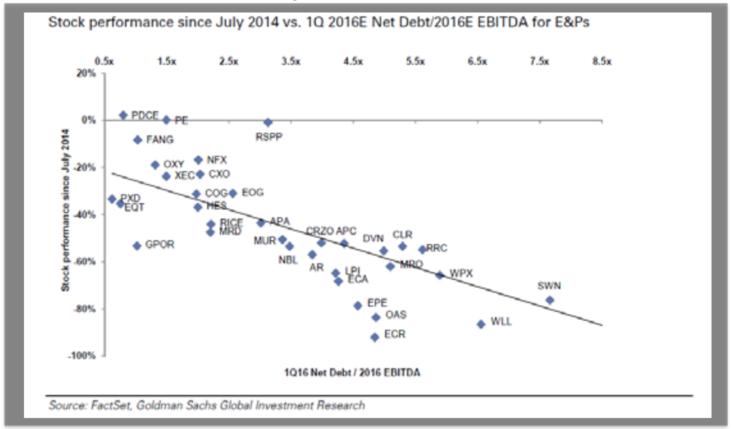
II. New Technology: New Financing Solutions

B. Distinguishing Between the Credit Cycle and the Commodity Cycle (Continued)

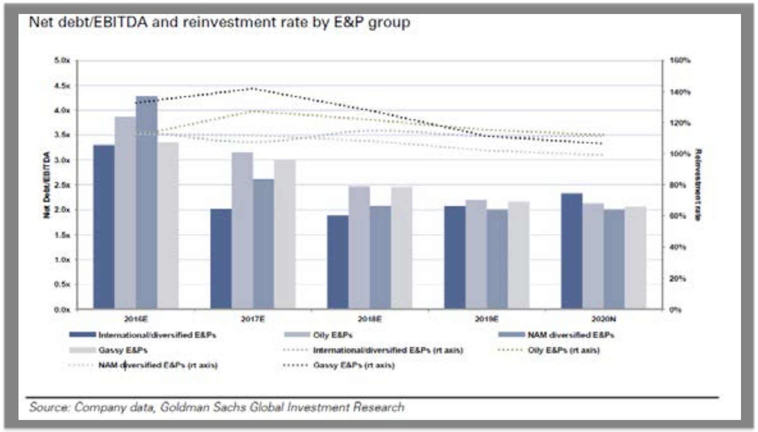
<u>Balance Sheet Strength</u>

Goldman Sachs Equity Research (2016, p. 9): "We believe investors and E&P's remain focused on deleveraging efforts … We see non-core asset sales, discounted debt repurchases/exchanges and equity offerings as 'tools in the toolbox.'"

Balance Sheet Strength Continues to be Primary Point of Emphasis for Investors



Leverage is Substantially Elevated in 2016/17, But Should Normalize in 2018



Source of Graphics: Goldman Equity Research (2016), Exhibits 10 and 11.

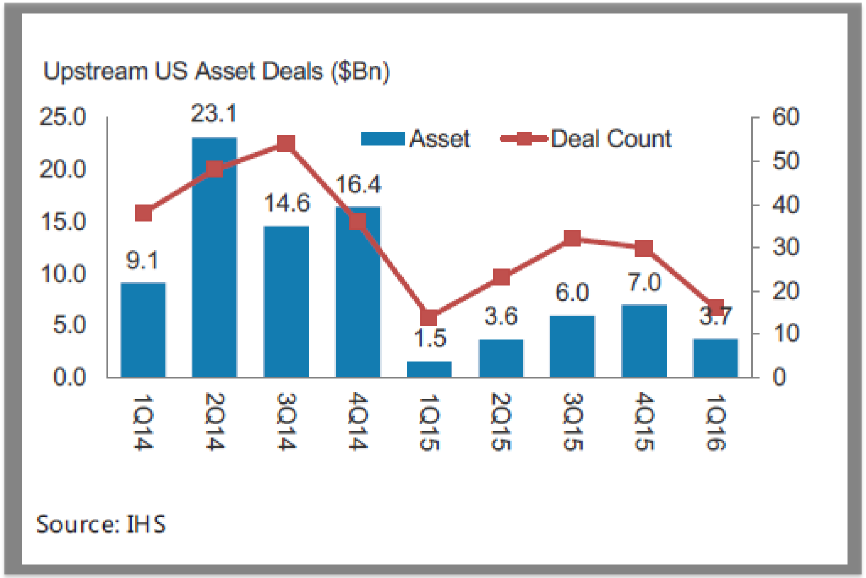
II. New Technology: New Financing Solutions

B. Distinguishing Between the Credit Cycle and the Commodity Cycle (Continued)

<u>Balance Sheet Strength (Continued)</u>

Morgan Stanley Research (2016, p. 12): Future production will have to be financed at "levels of cash flow outspend" that keep a company's "financial leverage consistent with historical levels."

E&P Asset Deals will Accelerate in a Recovery



Source of Graphic: Morgan Stanley Research (2016), Exhibit 66.

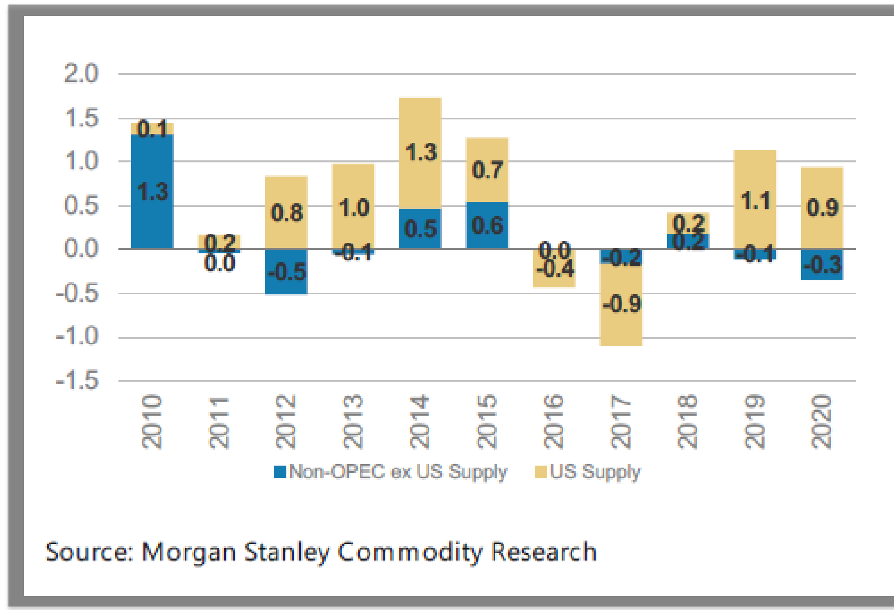
III. Shale as an Imperfect Swing Producer, But Perhaps Only in the Short-Term Future

A. "The Swing Producer in the Making"

<u>Balance Sheet Strength (Continued)</u>

Morgan Stanley Research (2016, p. 3): "Relatively short response time and favorable economics will likely make U.S. unconventional production the primary global 'swing' production when future oil growth is required, as many other forms of conventional oil production take 3-5+ years to respond materially to price signals."

US Production (YoY Growth MMBbl/d)



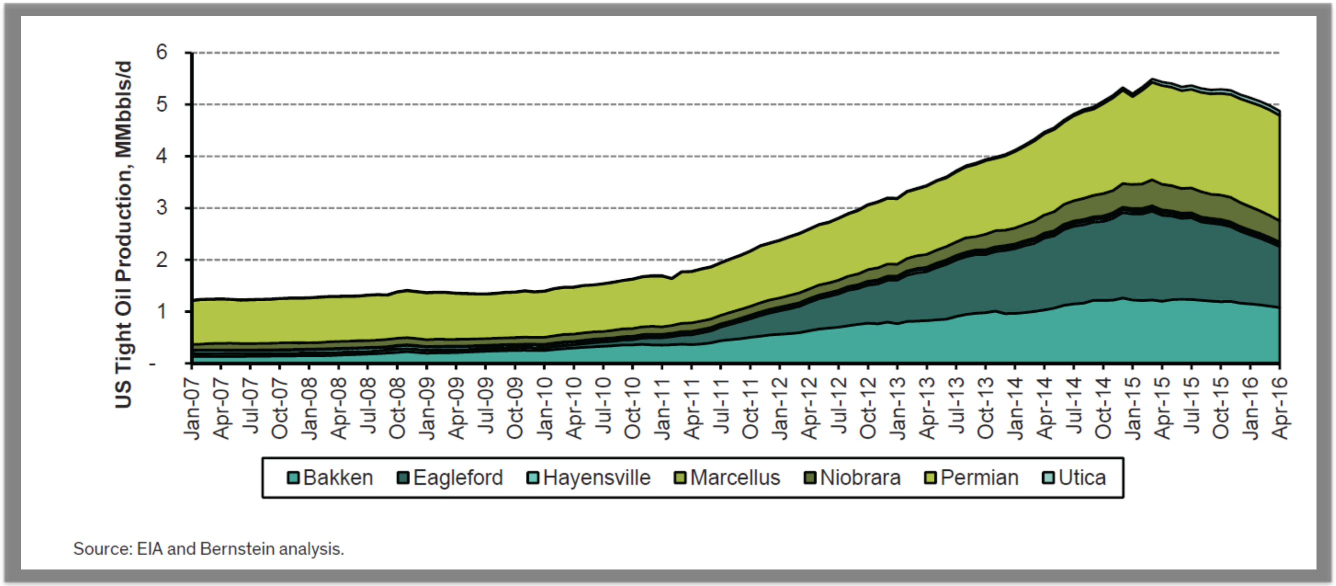
Source of Graphic: Morgan Stanley Research (2016), Exhibit 3.

III. Shale as an Imperfect Swing Producer, But Perhaps Only in the Short-Term Future

B. A Swing Producer … But With a Delay

Barclays Commodity Research (2016, p. 2): "US supply is falling m/m and will not act like a light switch. Just as it was slow to react on the way down, its response on the upswing will likely be lumpy."

The U.S. Tight Oil Supply Peaked in 2015 and is Now in Decline, Given the Capex Cuts



Source of Graphic: Bernstein Global View (2016), Exhibit 367.

III. Shale as an Imperfect Swing Producer, But Perhaps Only in the Short-Term Future

B. A Swing Producer … But With a Delay

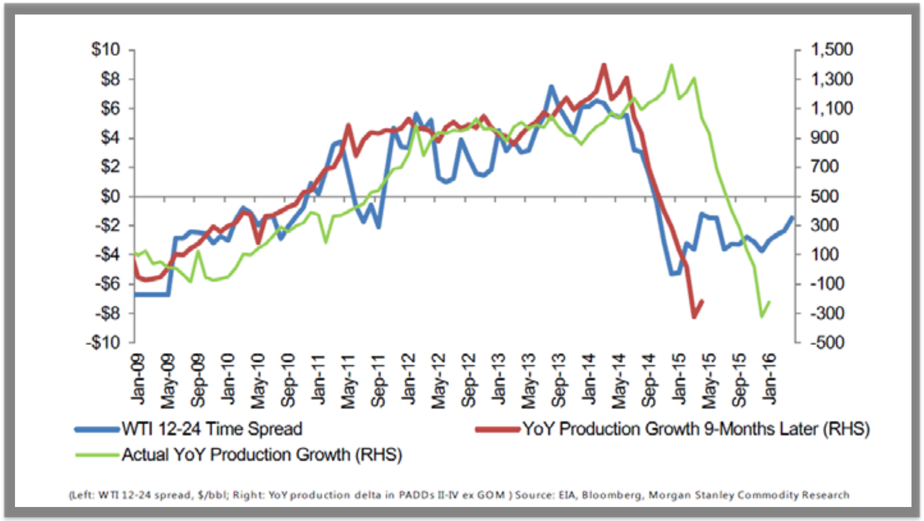
1. A “Lag Between Service Capacity Additions and Production Impact”

Morgan Stanley Research (2016, p. 26): “Frequently 6 months”

2. The Impact of Hedging

Morgan Stanley Research (2016, p. 40): “History shows a 9-month lag between hedging and production …”

WTI 12-24 Spread Reflects Hedging Behavior and Leads Onshore Production by 9 Months



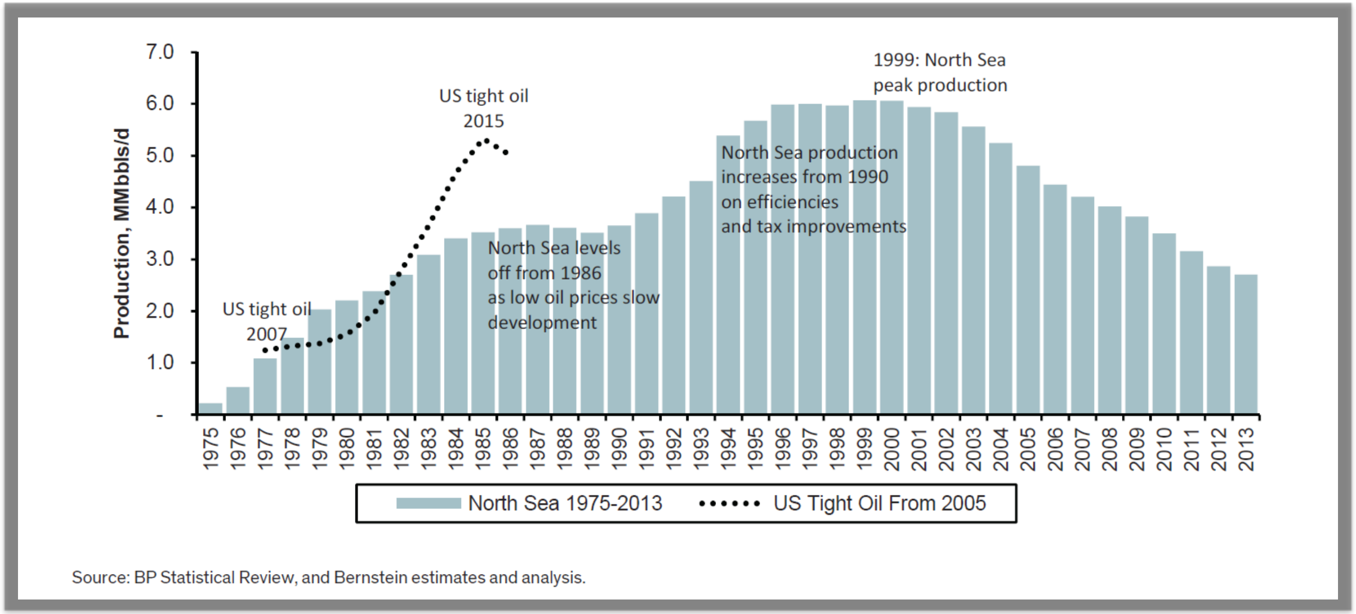
Source of Graphic: Morgan Stanley Research (2016), Exhibit 69.

IV. Ultimately, the Gulf Producers, Though, Could Revert to Being the Key Swing Producers

A. US Shale Oil Production Might Peak this Decade

Bernstein Global View (2016, p. 192): "[T]he growth in tight oil production is likely to be slower going forward than it has been in the past."

U.S. Shale Oil Production Growth to Peak This Decade as It Approaches the Peak Production Level of the North Sea with a Smaller Resource Base



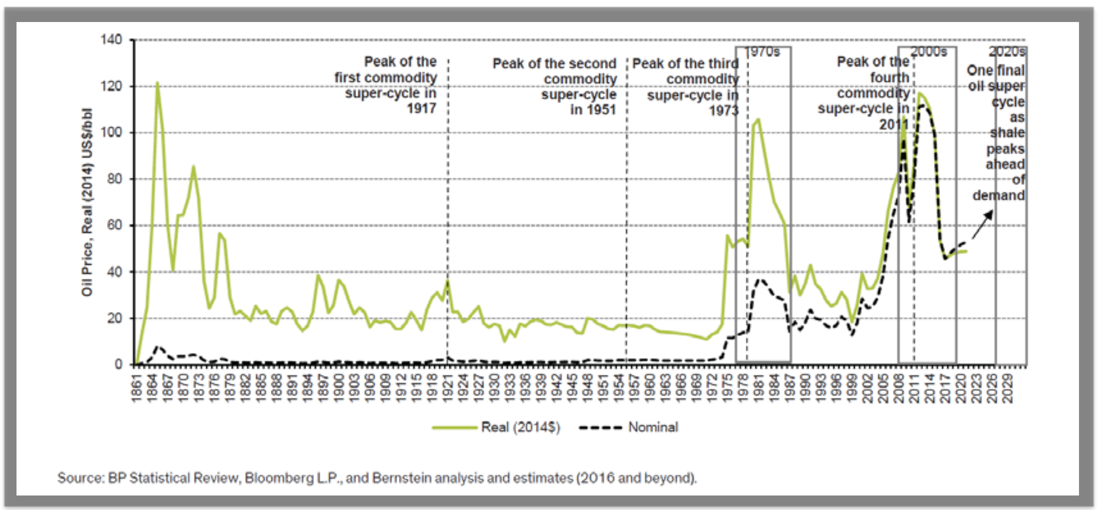
Source of Graphic: Bernstein Global View (2016), Exhibit 374.

IV. Ultimately, the Gulf Producers, Though, Could Revert to Being the Key Swing Producers

B. OPEC Would Thereby Become the Dominant Force Again

Bernstein Global View (2016, p. 194, p. 196): “Assuming tight oil peaks before demand does, it could result in another period of supply tightness as OPEC becomes a dominant force in supply, just as it did in the 1970s. … [I]t is not inconceivable that we could be four to five years away from the start of the next super-cycle.”

When Will the Next Oil Super-Cycle Be?



Source of Graphic: Bernstein Global View (2016), Exhibit 378.

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Hilary Till’s research papers can be found at: http://faculty-research.edhec.com/faculty-researchers/alphabetical-list/r-s-t/till-hilary-143898.kjsp?RH=faculty-gb1

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