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High and Rising Oil Prices, Despite the US Oil Production Boom

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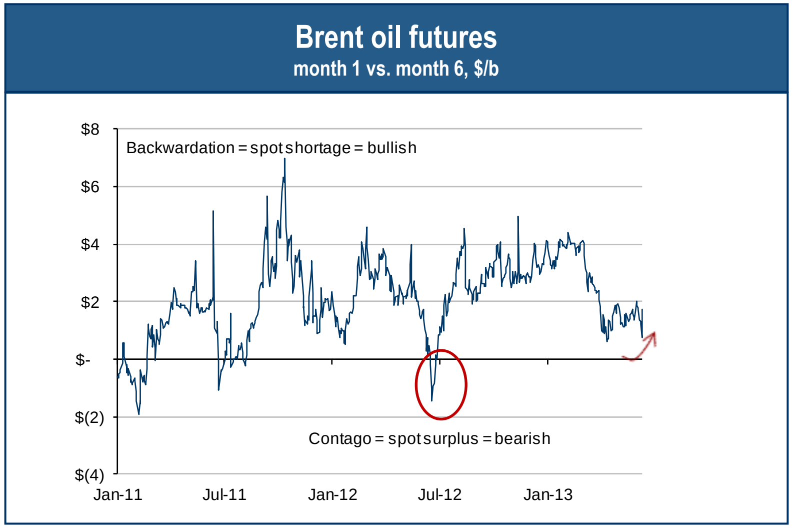
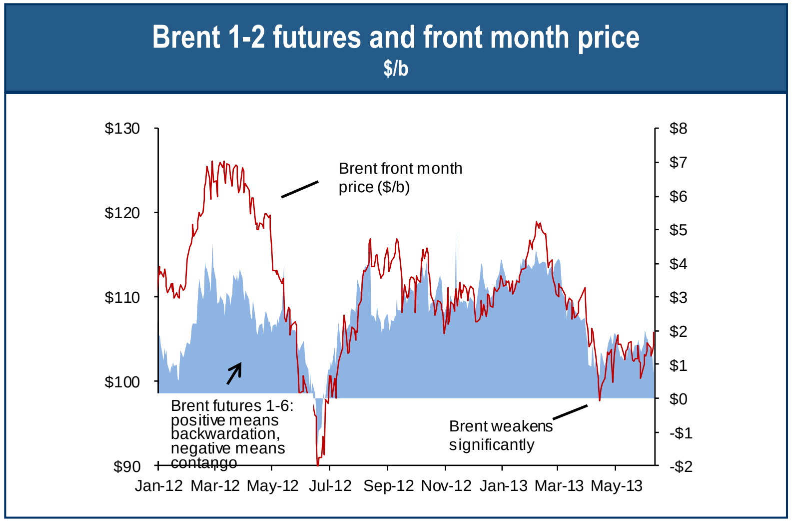
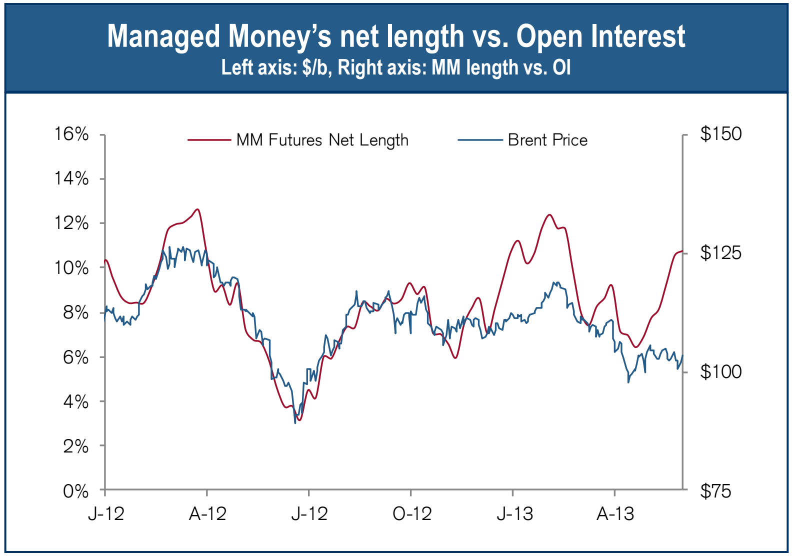
What do markets tell us







- Futures markets set global benchmark prices, i.e., Brent
- While not perfect, these markets reflect realities
- … and more often than not those realities involve fundamentals, i.e., supply and demand

Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research, IEA

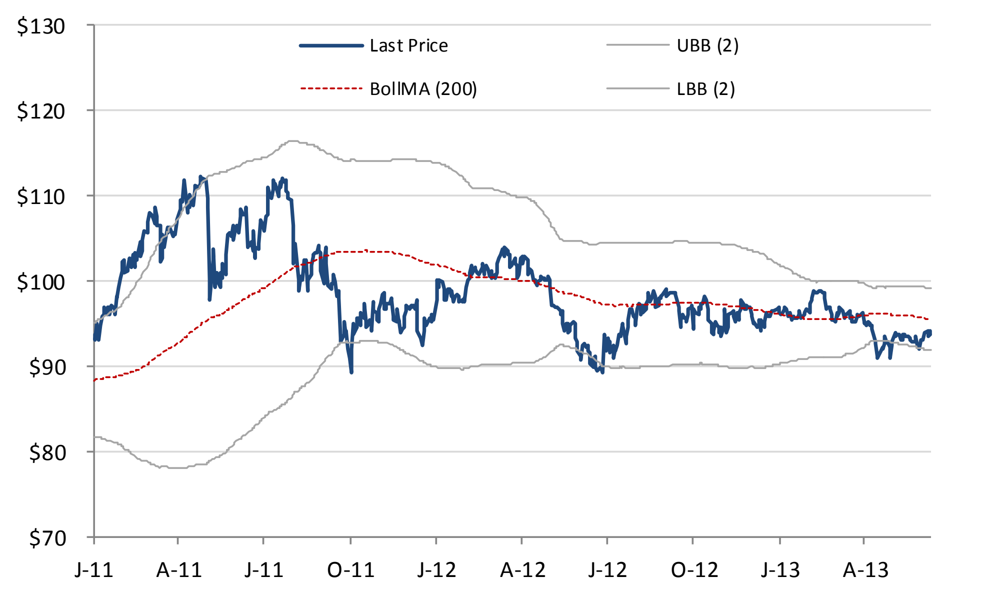
Long run markets are not worried, are clearing for ~$95 Brent

Long-dated Brent price, a "Fair Value" procy (2003, -->)
(Month 24 generic Brent crude oil, $/b)

- History of 2-year out Brent futures prices has a large 2007 -2008 spike
- Note that before then it found a $60-80 range; three- to four-fold the old $20 range
- Myriad interlinked factors, assumptions of higher costs etc
- .. In the end, the clear expectation of scarcity drove the parabolic 2007-08 trajectory

- Keep an eye on this indicator
- If I am wrong, it'll fall out of its range
- … but if I am correct, there's room to the upside

Markets clear in a narrow channel, but we note absence of natural buyers, lots of hedging
Brent flat price ($/b) for CO24



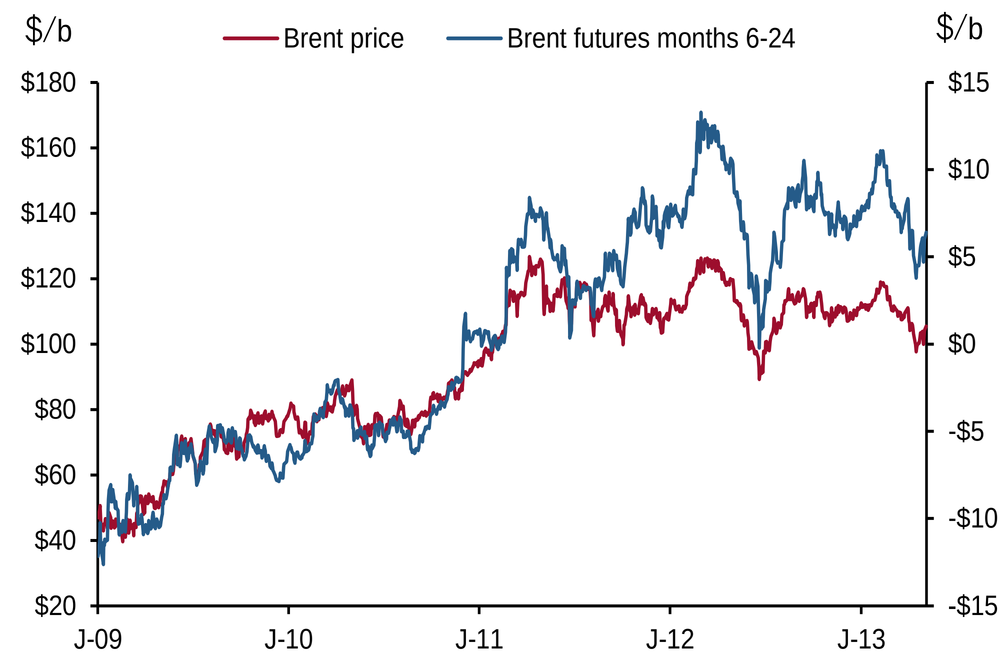
Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research, IEA

What has changed in the trading of long dated futures

- Traditionally long dated spreads moved in line with flat prices
- In the last two years, however, steeply backwardated spreads reflect producer selling more than anything else. No longer is the backwardation simply a symptom of s/d strength
- And no longer is the long-dated market trading as independently of the front

Brent flat price vs. Brent futures contracts month 6 – month 24

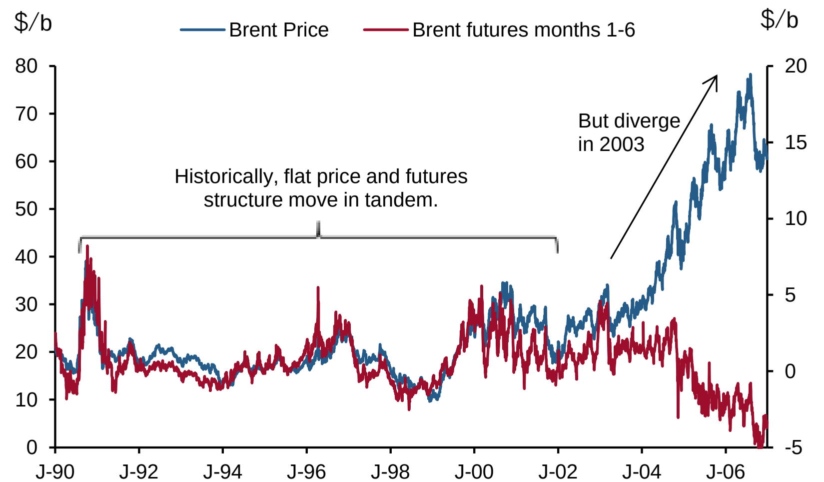
Flat price $/b (lhs); spreads $/b (rhs)



Source: Credit Suisse, the Bloomberg Professional ™ Service

History on structure and price – and of late the return of s/d

Flat price vs. futures structure – diverge in 2003-'06
Brent flat price $/b (lhs); Brent futures structure months 1-6 $/b (rhs)

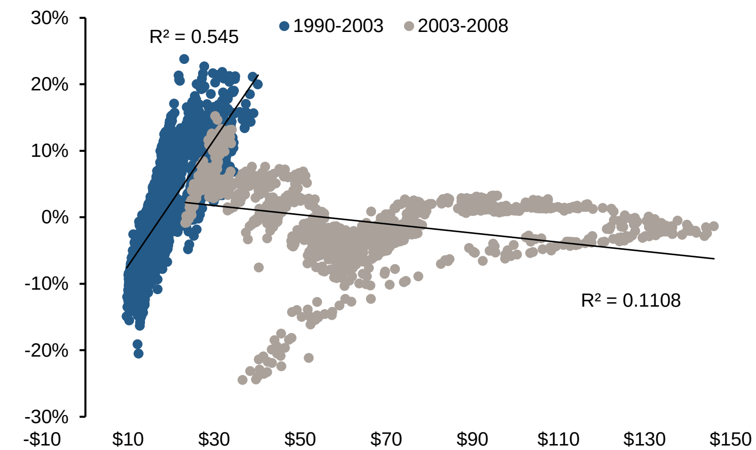


There was once a strong correlation between short dated spreads and flat prices that dissipated in the middle years of the last decade, and has become quite tentative in the years since the GFC. Here is a brief illustration of its recent history:

- Starting in 2003, perceived medium-term resource constraints helped to push up oil prices
- Price rallies became "back-end led." Speculative interest of long-dated futures rose manifold. The once "normal" or long run price of oil (~$20/b) inflated
- Traditional inventory-price regression models broke down

- As oil prices rose above $30/b to historic (nominal) highs, futures structure (here the difference between Brent contracts 1-6) maintained a moderated backwardation only in the 2003-04 period, when oil demand rose significantly and producers struggled to keep pace
- In 2005-06, by contrast, tension on physical oil markets abated while structure generally weakened, and periodically flipped into a contango. Yet prices doubled (to a near $80b by the summer of 2006.)

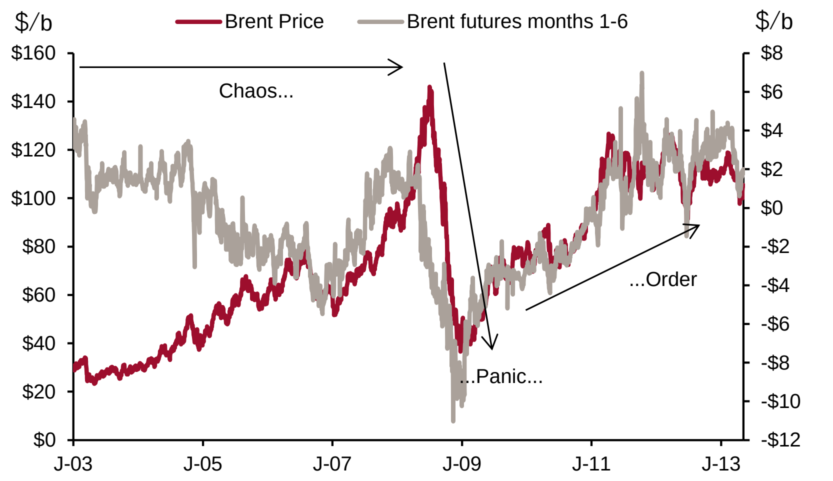
Another view of the same shift
Brent price vs. Brent futures 1-6 measured as a % of flat price



Source: Credit Suisse, the Bloomberg Professional™ Service

Price and structure re-aligned, prompt fundies count

Flat price vs. futures structure – re-align post 1Q2009
Brent flat price $/b (lhs); Brent futures structure months 1-6 $/b (rhs)

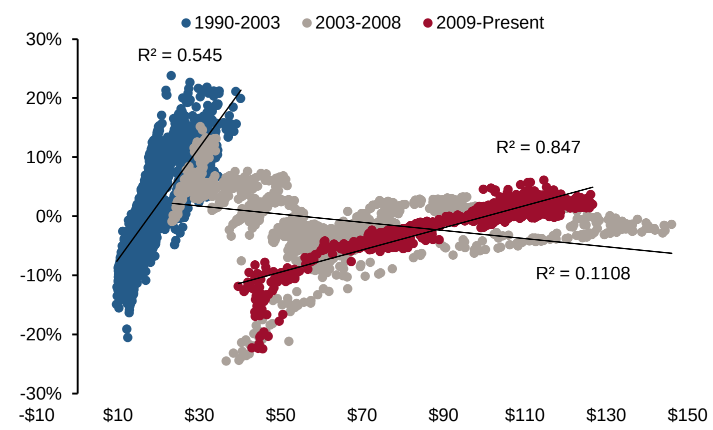


- Things collapsed and correlated all too neatly in the last half of 2008
- And since then structure has moved more or less in line with flat price

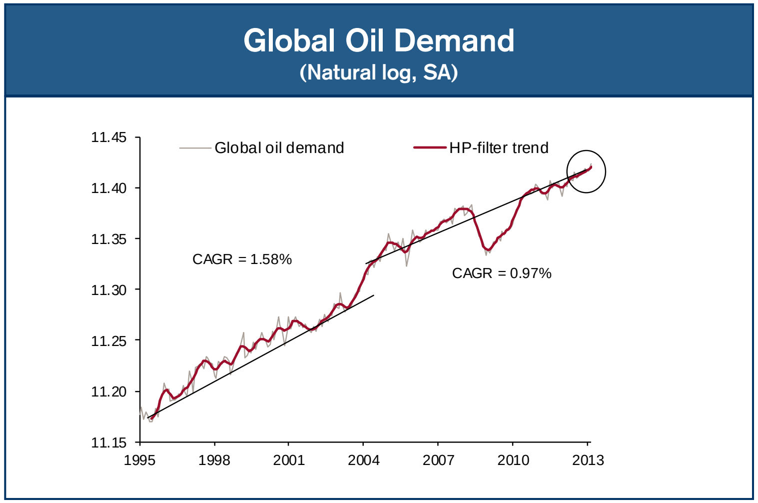
Source: Credit Suisse, the Bloomberg Professional Service

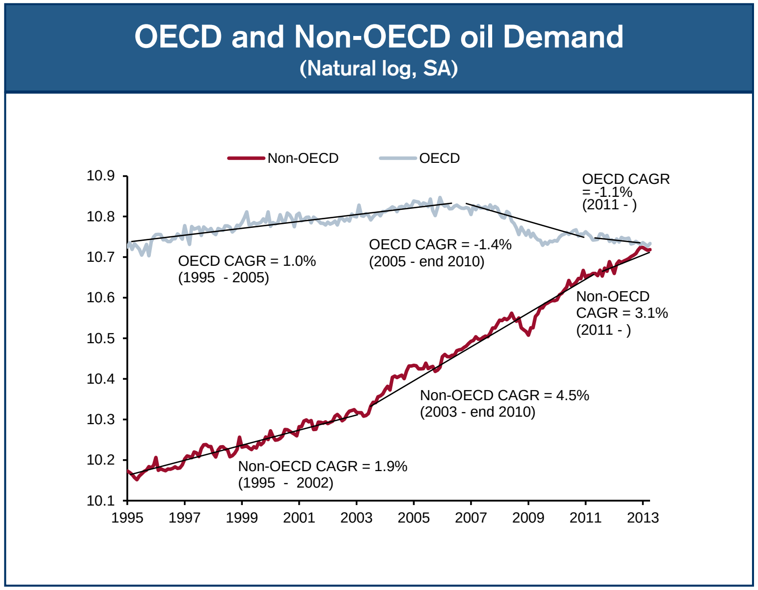
- In 2007 and early 2008, a global refining bottle-neck coincided with compounding diesel demand pressure that drove another doubling of oil prices from near $60/b to ~$120 in May of 2008
- A last noteworthy divergence of price and structure in the summer of 2008 was caused by last gasp run-up in long-dated prices just as near-term physical markets began to weaken quite abruptly in June of 2008

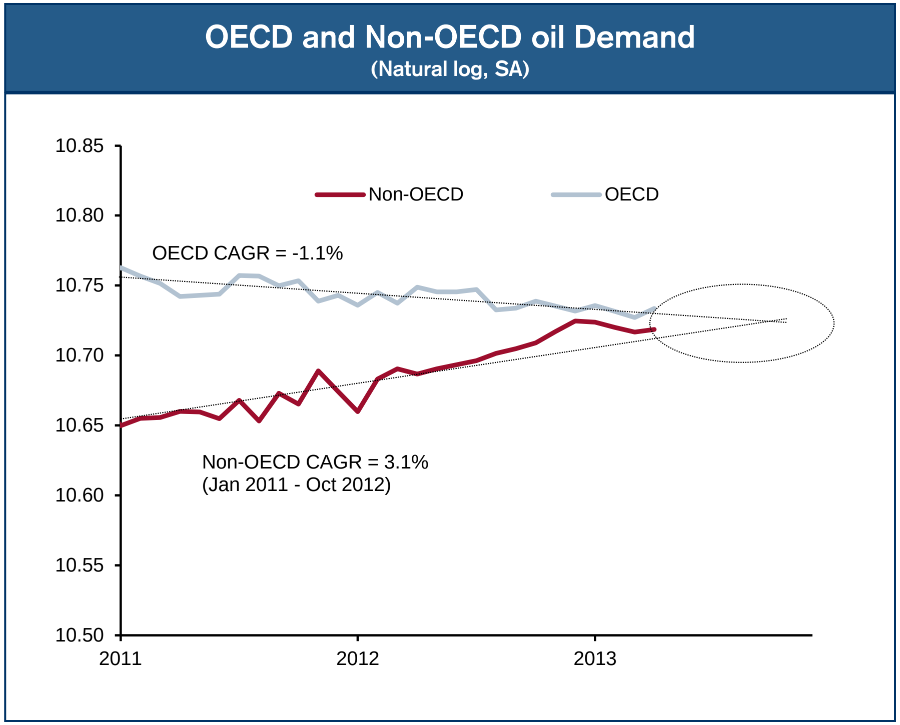
Another view of the same shift
Brent price vs. Brent futures 1-6 measured as a % of flat price



Oil demand: Neat trends and a historic crossover in 2013



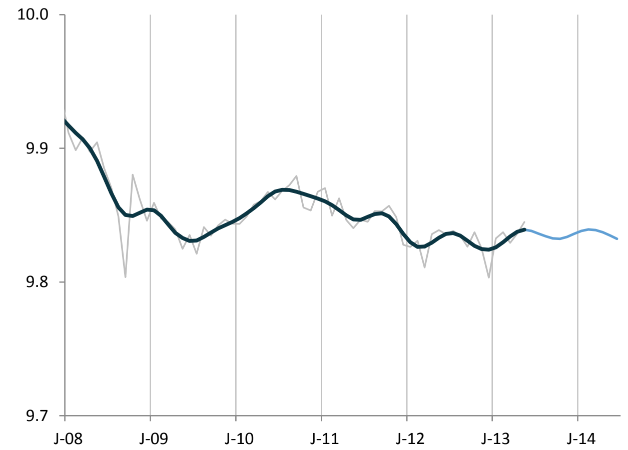




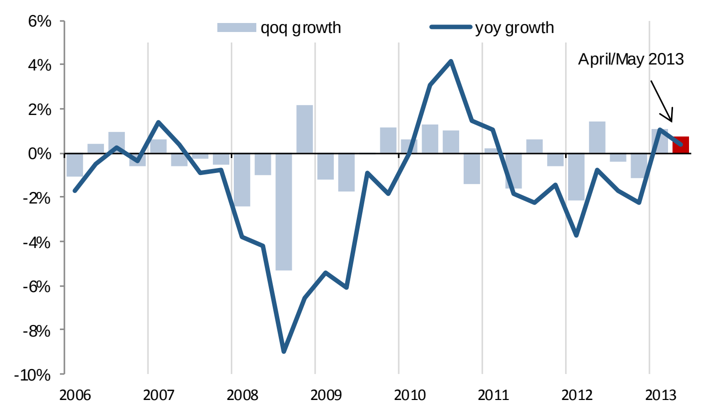
Source: IEA, Credit Suisse Global Commodities Research

US oil use began to recover in 2012 and may have upside

US oil demand: data and forecast
(Natural log, SA)



US oil demand growth, latest data and recent history
(SA qoq and yoy)



Source: IEA, Credit Suisse Global Commodities Research

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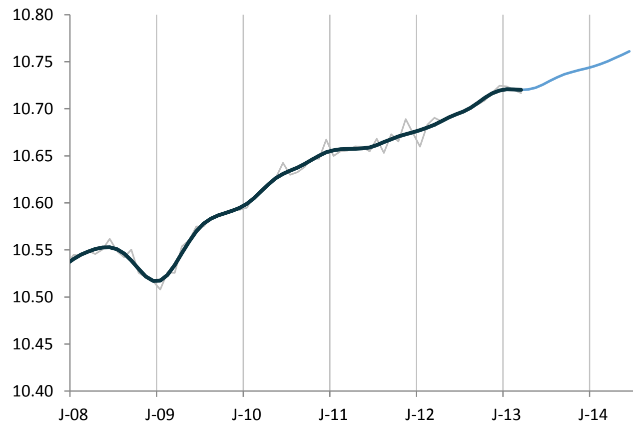
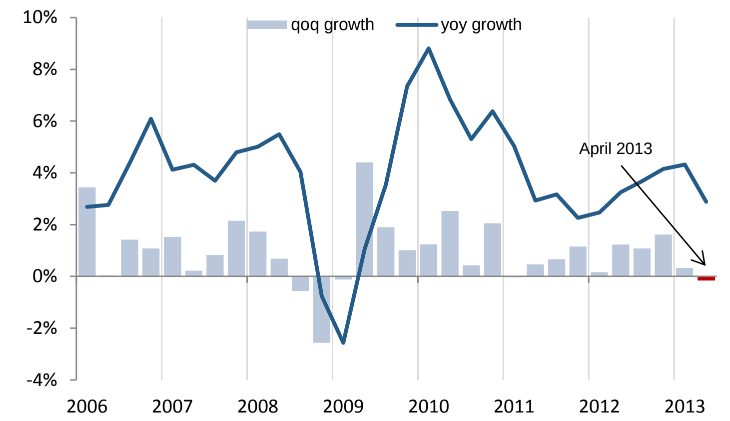
Emerging Market oil demand growth, the overlooked 3-4%pa

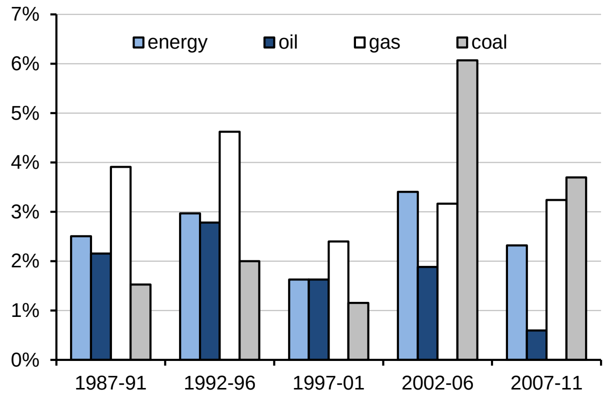
EM oil demand: data and forecast
(Natural log, SA)



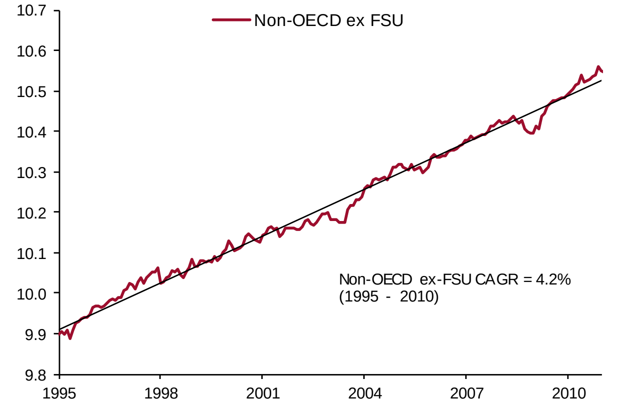
EM oil demand growth, latest data and recent history
(SA qoq and yoy)



Global primary energy demand by source
(average annual % growth)



EM oil demand (ex FSU), has no "super-cycle"
(sa t-13 log scale, monthly data through Oct 2012)



Source: IEA, Credit Suisse Global Commodities Research

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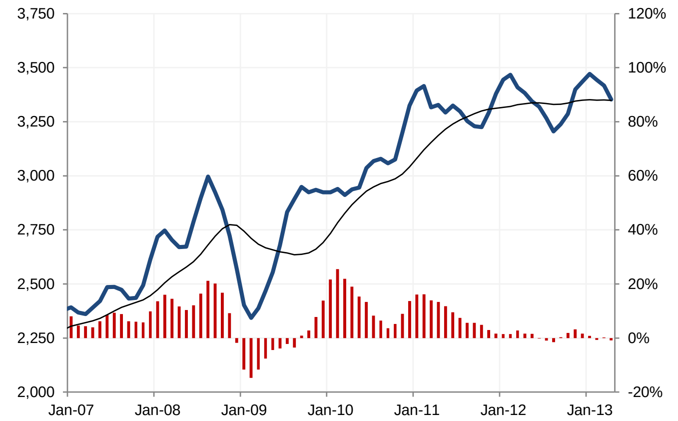
Chinese demand for different products has diverged

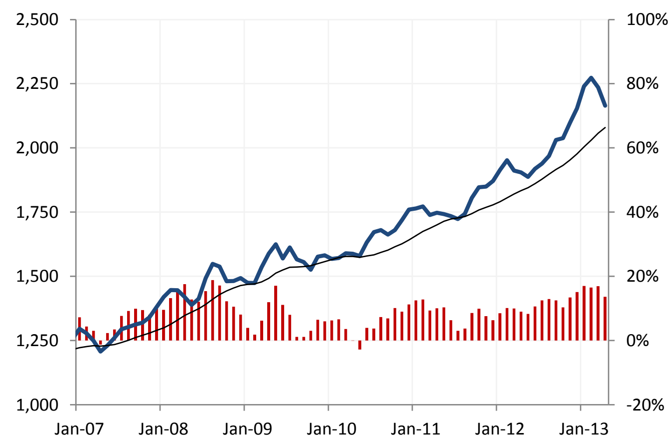
Diesel demand growth has flagged over the 18 months
(kb/d (lhs); % growth (rhs))



- Diesel use is most directly linked to economic performance
- Which recently has underperformed trend, if these diesel data are to be believed
- And as an aside, critically important in trying to frame the market response to fundamental shifts in supply is what growth rate to assume for EM (China included)

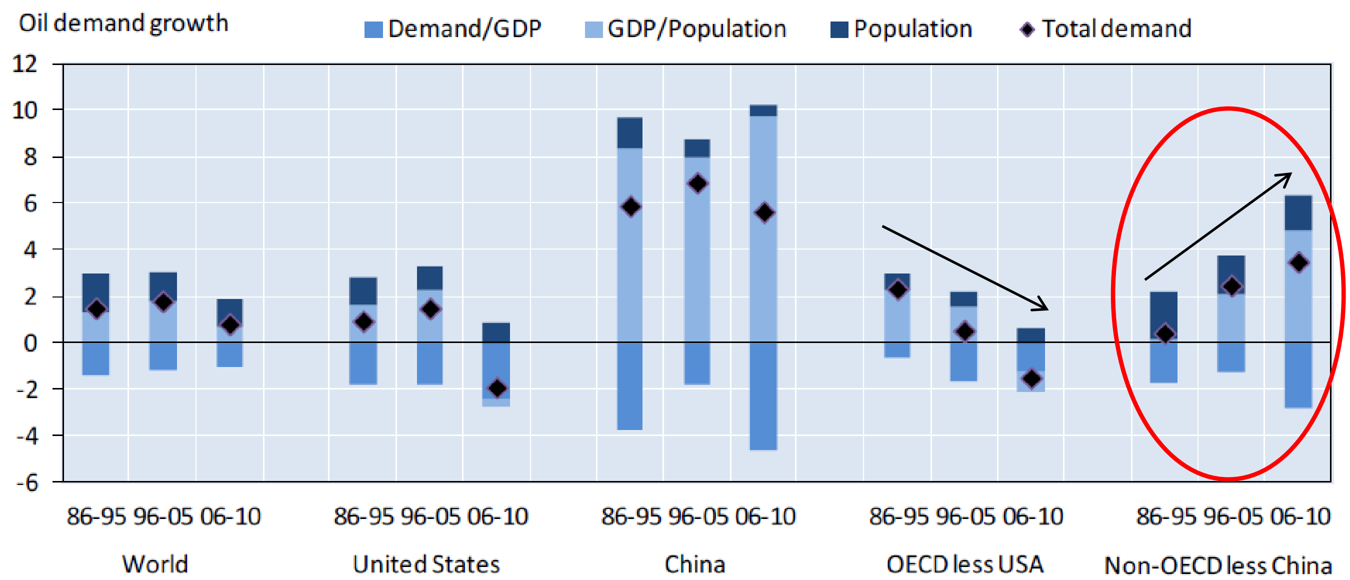
- After that, as economies evolve further
- One could do worse than to track indices of vehicle ownership to begin to ascertain the slope of gasoline demand growth

Gasoline demand growth is steadier (accelerates…?)
(kb/d (lhs); % growth (rhs))



Source: Credit Suisse, BP, World Bank Group

Overall, even in the high price era, efficiency has been overwhelmed by rising standards of living and demographics

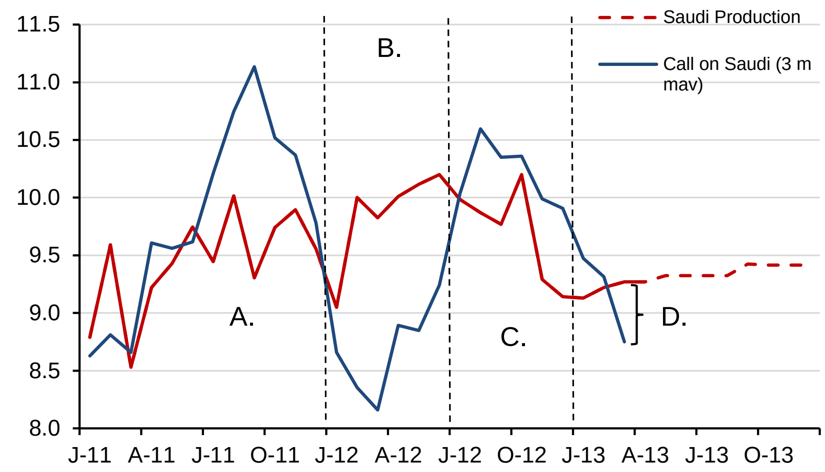


- The decrease in economic oil intensity has had an effect, particularly in the OECD
- However, surging demographics in South/South East Asia, the Middle East and Africa have had a powerful effect
- And ultimately, increasing living standards across emerging markets have led to greater demand for oil products, overwhelming the increasing efficiencies of the developed world

Source: Credit Suisse, OECD

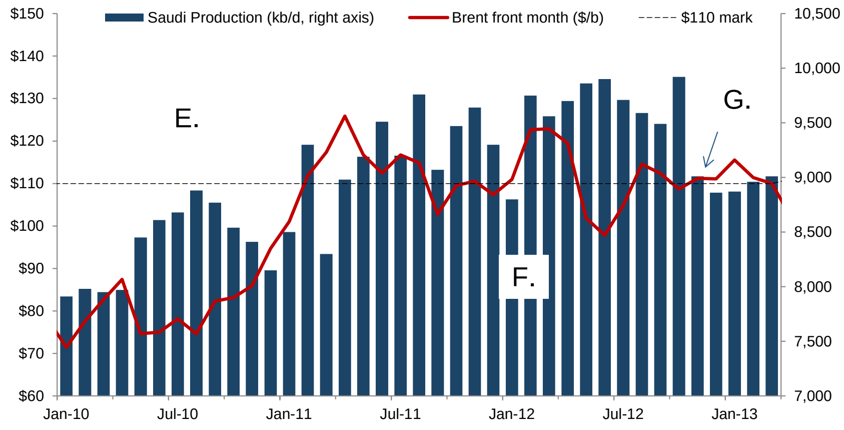
Can Saudi Arabia continue to balance the market?

The call on Saudi Arabia vs. Saudi crude oil production
Mb/d



- A: Saudi makes up for some of the Libya shortfall. Commercial stocks fall in the OECD leading to rising prices and an SPR release
- B: As sanctions take effect, Saudi opened up the taps, building inventories
- C: A balanced market in 2H 2012
- D: Deep refinery maintenance and flat Saudi crude production lead to stock builds

Saudi Arabia's crude oil production vs. Brent Price
Saudi crude oil production kb/d (rhs); Brent flat price $/b (lhs)

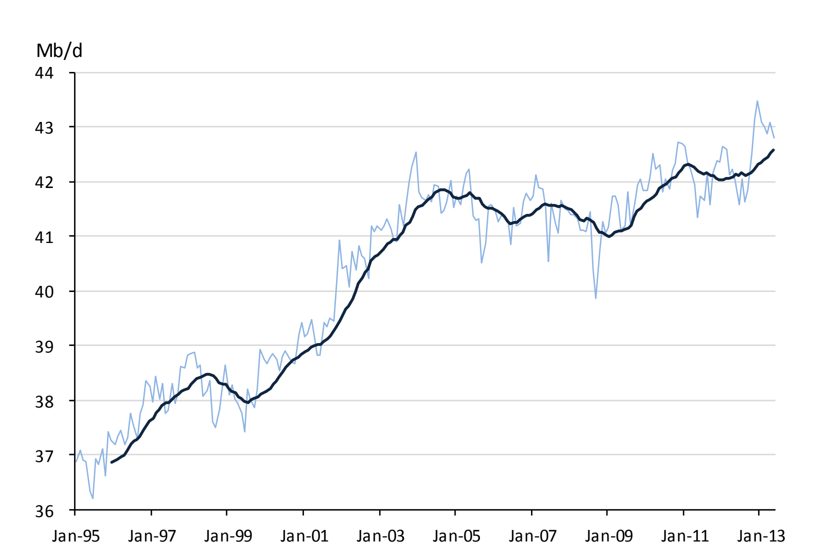


- E: Lower production in the wake of the GFC, when oil was under $100/b
- F: Increased output to compensate for disruptions from first Libya and then Iran … and when Brent price reaches over $110/b
- G: Oct'12, a particularly well timed output cut

Source: Credit Suisse, IEA, JODI, EIA, the Bloomberg Professional ™Service

Supply: US' tight-oil bonanza isn't shifting global trends, yet

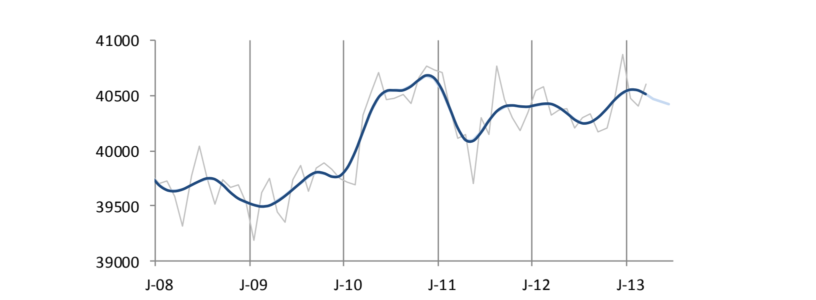
Non-OPEC crude oil production still isn't going anywhere



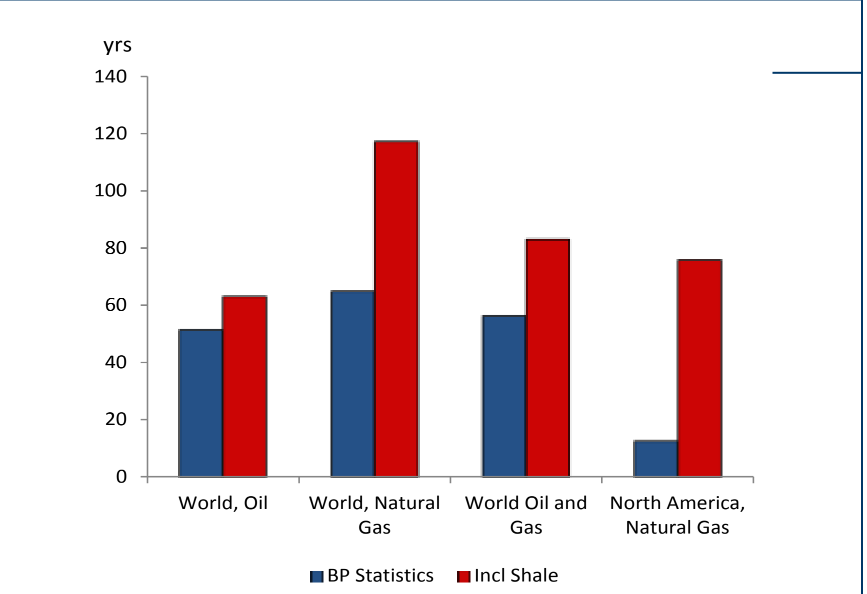
The data are clear:

- The post 2008 rise in non-OPEC *crude oil* production flattened out in recent years. Of late, it's growing again, but less fast than most assume (despite the enormous growth of US output)
- **In fact,** the more important message is that the underlying decline of the global supply base should continue to moderate the slope of aggregate supply-growth through 2019

Non-Opec ex US, Sudan Syria, Yemen (All liquids, SA, kb/d)



The oil shale (or tight oil) story is less impressive than that of gas



Source: IEA, EIA, Jodi, Credit Suisse

Volatile dynamics across MENA threaten exports and supply

Geo-Political Currents
US withdraws / consolidates
Ascendant Turkey
China's (Asia's) rising needs
European & Russian client relationships

Regionally – fuzzier borders:
War in Syria spilling over
Sunni v Shia
Nuclear ambitions
Iran v Saudi
KRG (Kurdish) nationalism
Israel v Palestine

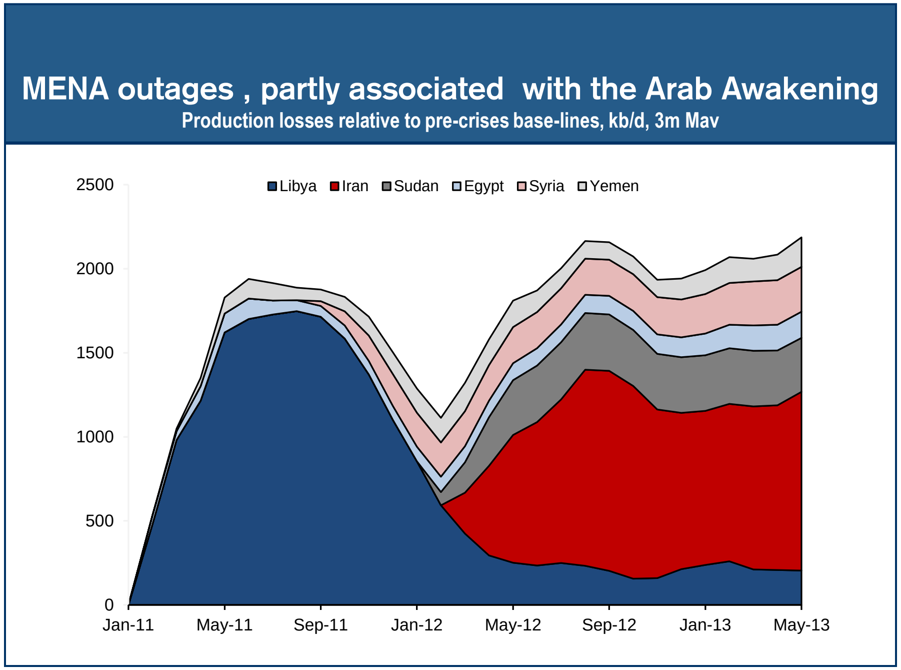
Domestic – centrifugal forces often abound:
In Power: Ageing Minority Autocratic Elites
Surging youth unemployment, failing agricultural sectors
Increasingly complex societies
Narrowly based economies
Trend toward more participatory government
Long, messy and unpredictable transitions from old to new more or less stable governing structures and governments

Until the dust settles, the business of oil across MENA remains more challenging

- Insecure climate, involves: uprisings; sectarian clashes; border conflicts; terrorism; cyber war etc.
- Multitude of practical hurdles to outside investments
- Ongoing dearth of local expertise at all levels
- Fraying of long established political and commercial relationships, in many cases (e.g., Libya, Egypt)
- After initial conflicts, surplus of poorly integrated former combatants combines with power-vacuums that are open for extremists to fill

Source: Credit Suisse Global Commodities Research

Production is down across MENA

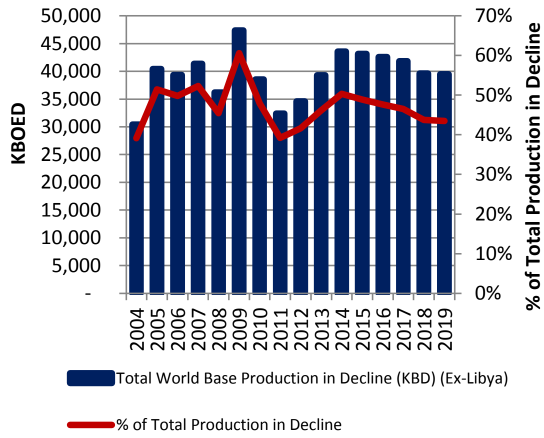


- Since the start of the 'Arab Awakening,' Mena oil supplies have been disrupted.
- Currently, the global s/d balance is ~2 Mb/d tighter than it would be if Libya, Iran, Sudan, Egypt, Syria, and Yemen were producing at historical levels.
- In our estimates we keep the majority of the outages in place through 2014 …
- … but we cannot quantify (let alone time) the next one

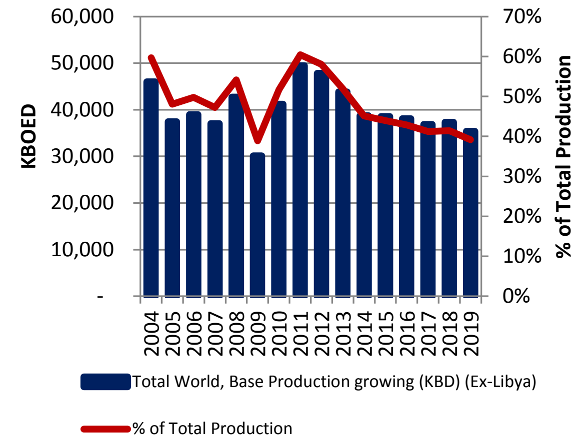
Source: Credit Suisse Global Commodities Research, Petrologistics

Global oil supply base is ageing, looking at three categories

40-45 Mb/d of the production base is in decline



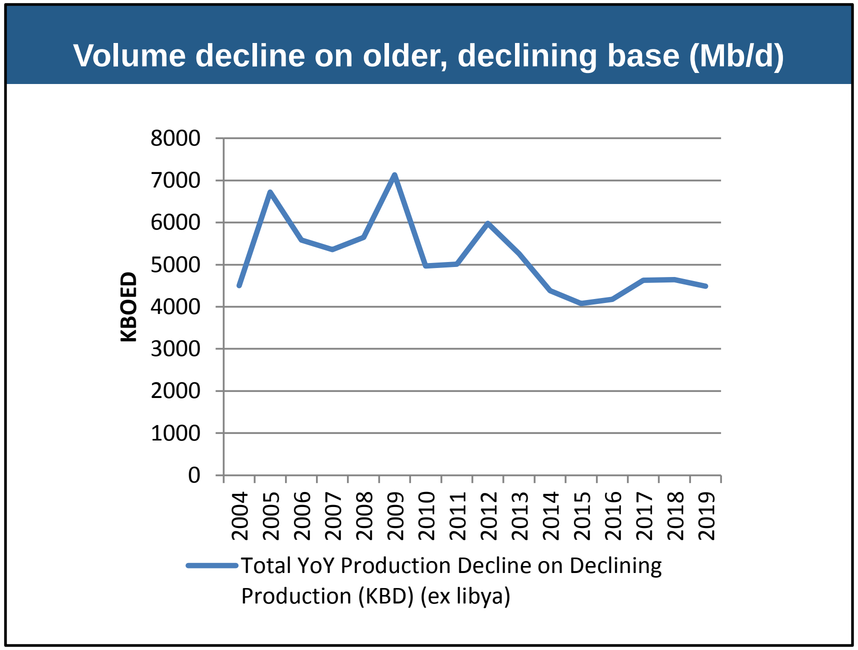
Only 35-40 Mb/d of the base is still growing

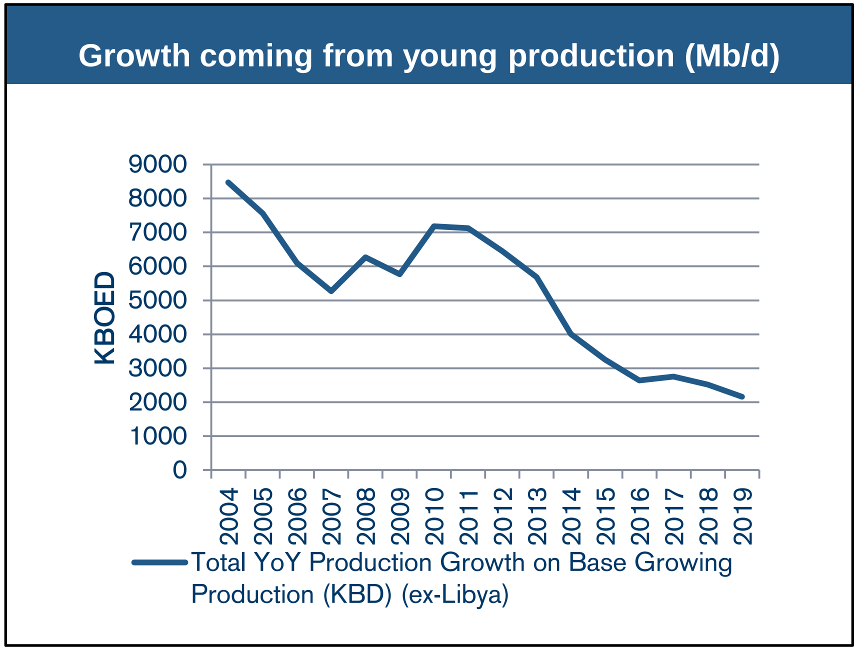


- We use WoodMac data to separate 6,000 fields into those that are young enough to still grow (teenagers), those that are starting to decline (pre-mobile phoners), and new fields that have not started up yet (infants)
- The share of global production that is in decline is around 40-50%
- The share of global production that is young enough to grow is set to fall from 50% to 40%
- We use our own forecast of US oil and NGL growth, i.e., US oil grows from 6MBD to 10MBD by 2018

Source: Wood Mackenzie, Credit Suisse Research

… declining

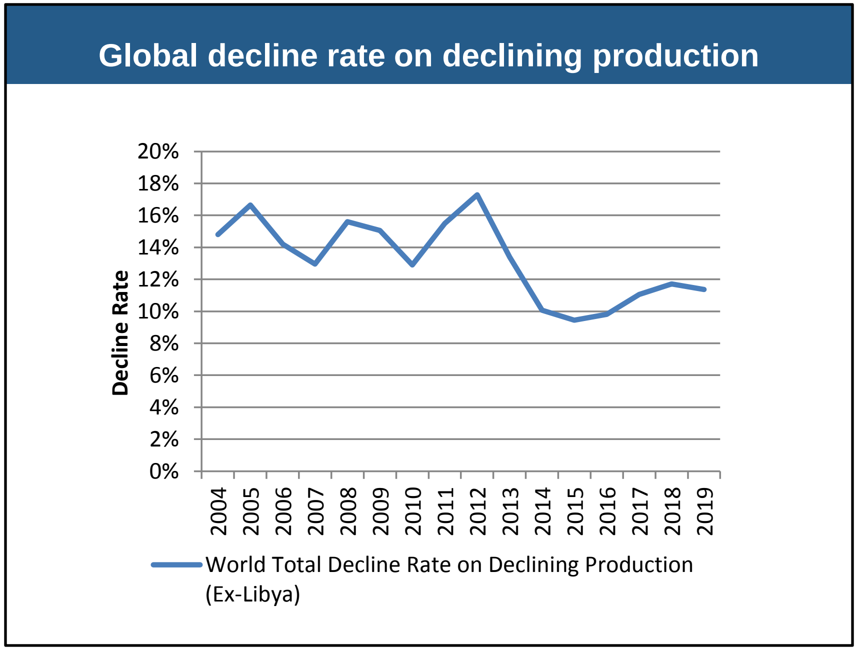


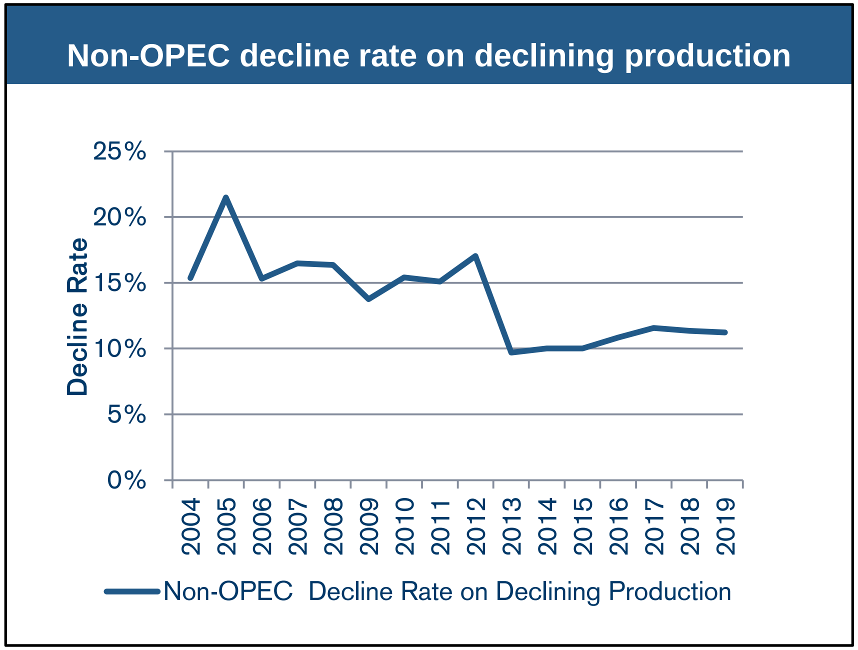


- Around 4-4.5MBD of decline annually
- Less focus on the contribution from “still-growing fields,” which are set to fall from 6-7MBD down to just 2-3 MBD over time

Source: Wood Mackenzie, Credit Suisse Research

Global decline rates since 2004

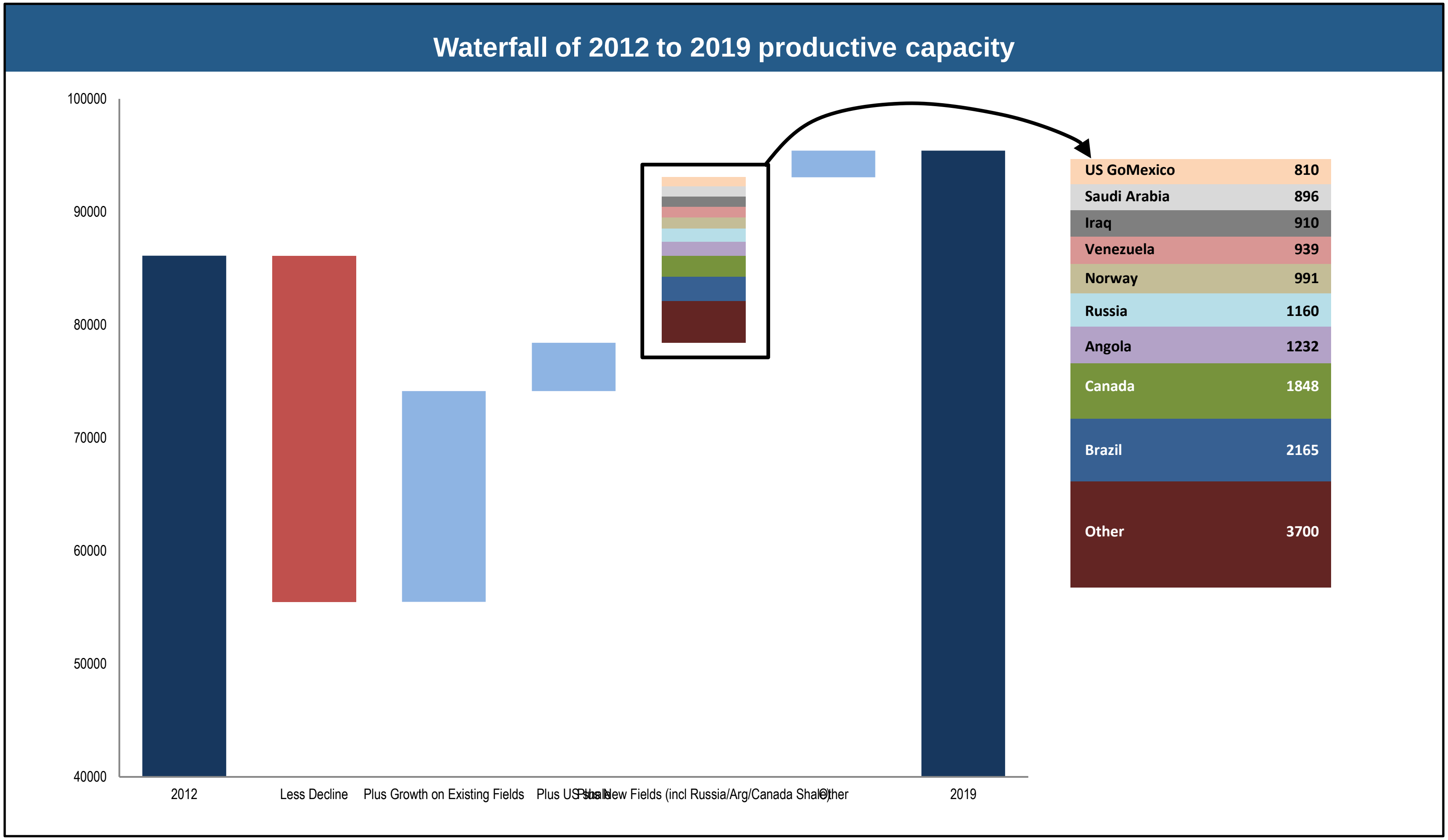




- We observe lower decline rates going forward – due to a shift in the non-OPEC production mix
- This helps offset a higher share of declining fields and a weaker contribution from growing production

Source: Wood Mackenzie, Credit Suisse Research

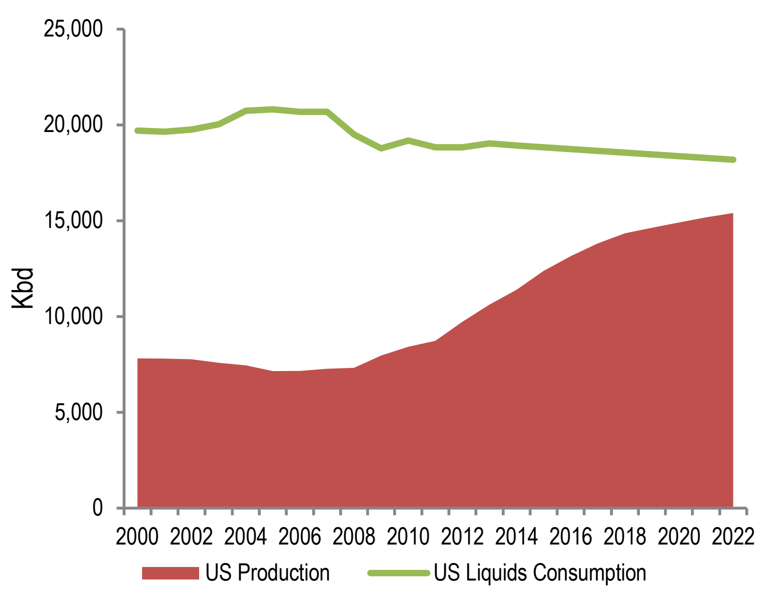
Adding up the moving parts of the medium-term outlook



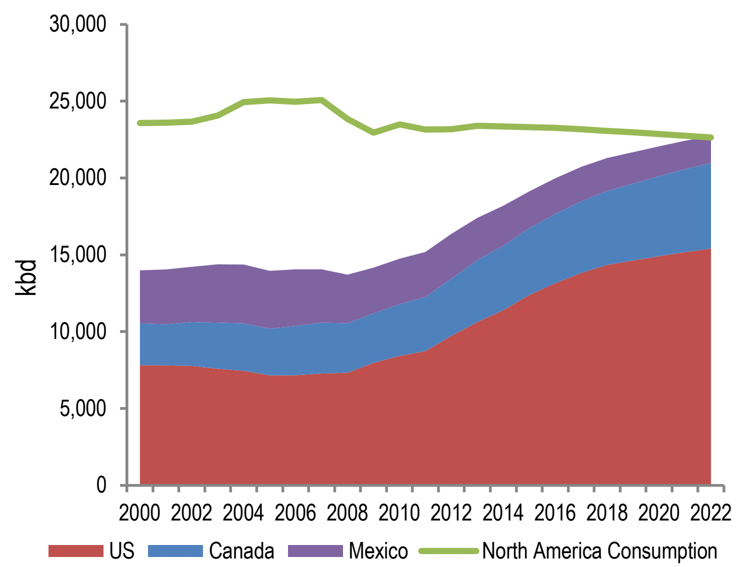
Source: Wood Mackenzie, Credit Suisse Research

U.S. oil independence?

US liquids consumption and production outlook



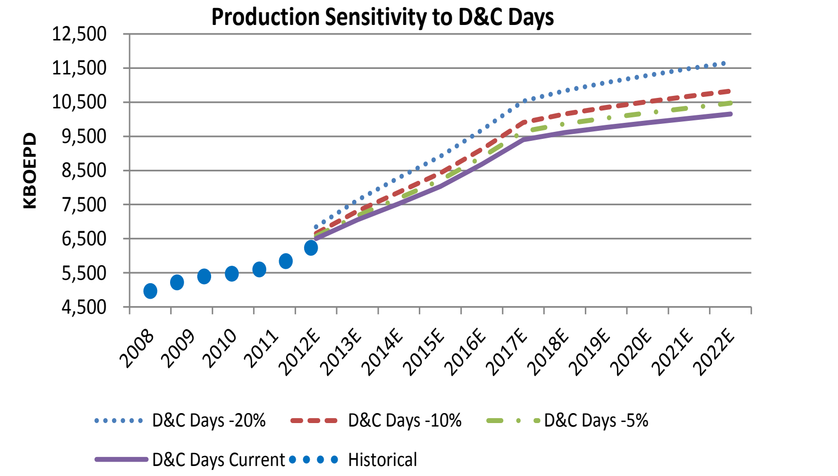
North America liquids consumption and production outlook

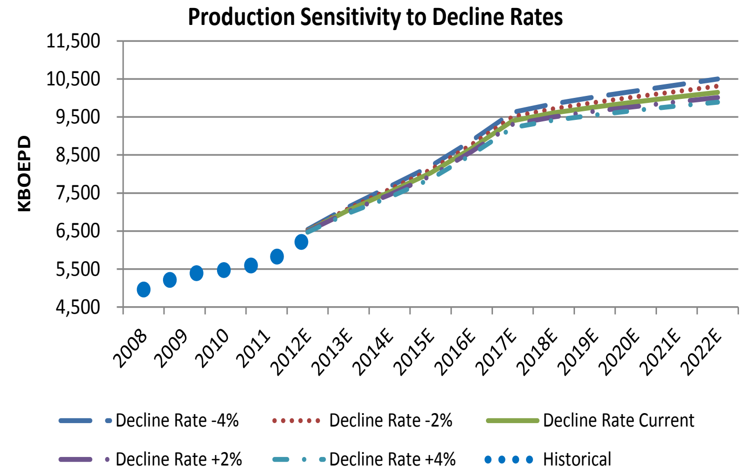


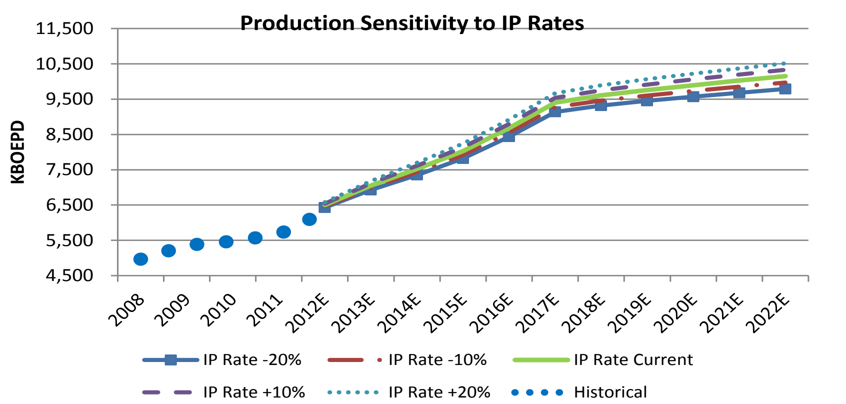
- We assume 20% improvement in observed IP rates, 25% more wells drilled per annum than in 2012
- Model requires near-term oil prices >$100/bbl Brent to fund ongoing capex
- Depending on acre spacing and the core acreage extent – drilling 87% of Eagleford, 86% Bakken, 77% core Wattenberg
- Industry is skeptical that US will reach this level of production

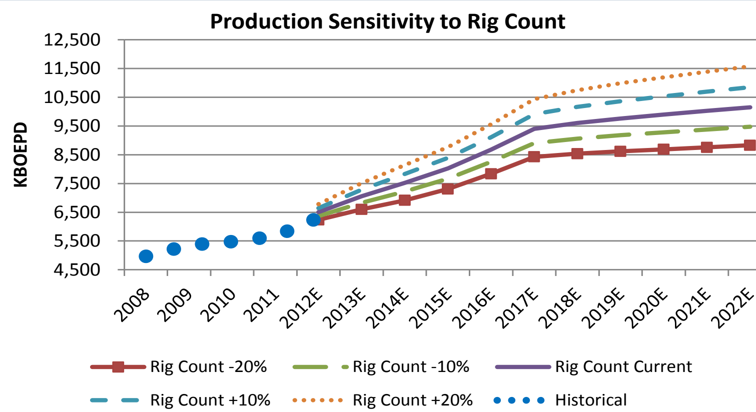
Source: EIA, Credit Suisse estimates

Sensitivities







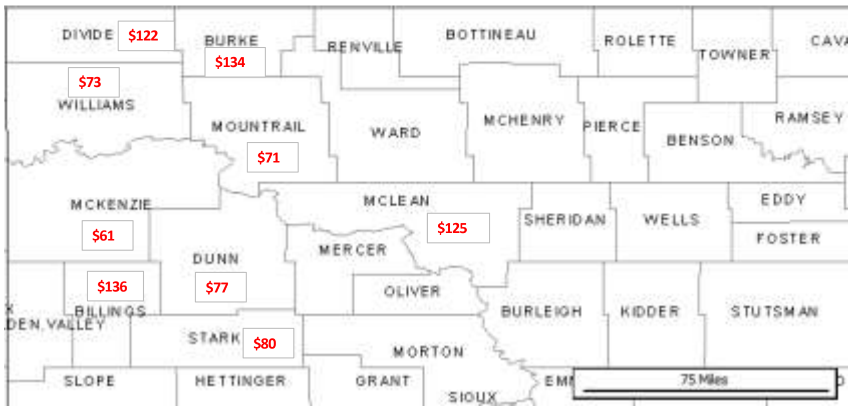


Source: Credit Suisse estimates

Large breakeven price discrepancies exist within shale plays

Bakken: WTI price breakevens

Based on reported IP by county



- Producers in the most prolific Bakken and Eagle Ford acreage can essentially print money
- However, in counties outside of the oil 'sweet spot,' at current prices, drillers are already priced out of the market

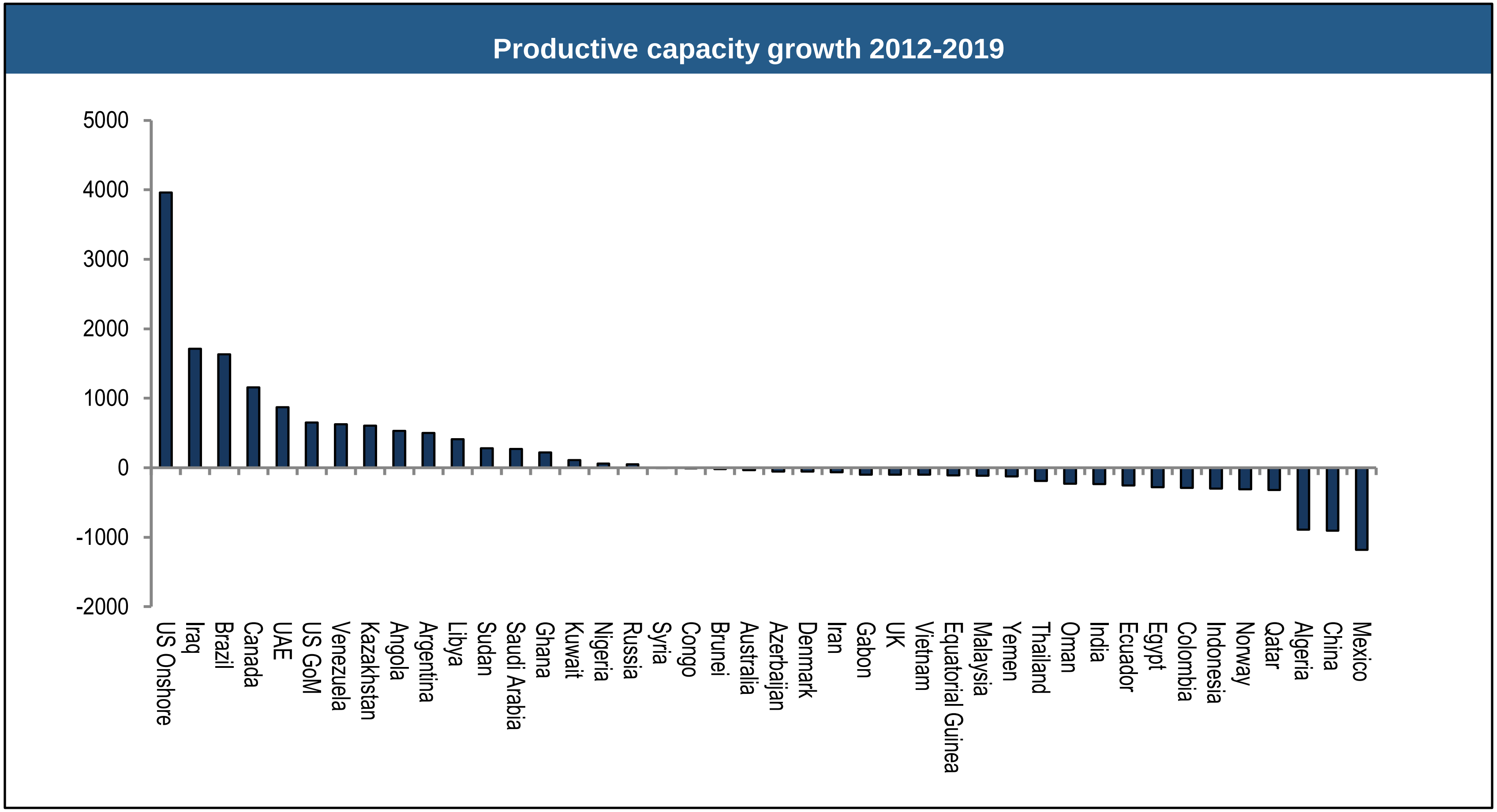
Eagle Ford: WTI price breakevens

Based on reported IP by county

- Particularly in the Eagle Ford, there are massive differences between breakeven prices in the most economic counties, such as Dewitt, and most expensive counties such as Wilson
- These differences are related to infrastructure/water constraints, geology and most of all the productive capacity of the wells
- Wells that produce more crude, less condensate and NGLs, tend to be the most profitable

Source: Credit Suisse, HPDI

Absolute growth by country 2012-2019



- Equates to around 1MBD p.a. of production growth
- 1% higher decline would reduce this by 220kbd p.a., no recovery in Syria/Sudan/Nigeria by 115kbd p.a.

Source: Wood Mackenzie, Credit Suisse Research

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Buy: Indicates a recommended buy on our expectation that the issue will deliver a return higher than the risk-free rate.

Sell: Indicates a recommended sell on our expectation that the issue will deliver a return lower than the risk-free rate.

Corporate Bond Fundamental Recommendation Definitions

Buy: Indicates a recommended buy on our expectation that the issue will be a top performer in its sector.

Outperform: Indicates an above-average total return performer within its sector. Bonds in this category have stable or improving credit profiles and are undervalued, or they may be weaker credits that, we believe, are cheap relative to the sector and are expected to outperform on a total-return basis. These bonds may possess price risk in a volatile environment.

Market Perform: Indicates a bond that is expected to return average performance in its sector.

Underperform: Indicates a below-average total-return performer within its sector. Bonds in this category have weak or worsening credit trends, or they may be stable credits that, we believe, are overvalued or rich relative to the sector.

Sell: Indicates a recommended sell on the expectation that the issue will be among the poor performers in its sector.

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Corporate Bond Risk Category Definitions

In addition to the recommendation, each issue may have a risk category indicating that it is an appropriate holding for an "average" high yield investor, designated as **Market**, or that it has a higher or lower risk profile, designated as **Speculative** and **Conservative**, respectively.

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	Global Recommendation Distribution**	
Buy	5%	(of which 100% are banking clients)
Outperform	24%	(of which 85% are banking clients)
Market Perform	53%	(of which 85% are banking clients)
Underperform	16%	(of which 80% are banking clients)
Sell	<1%	(of which 100% are banking clients)

*Data are as at the end of the previous calendar quarter.

**Percentages do not include securities on the firm's Restricted List and might not total 100% as a result of rounding.

Disclosure Appendix cont'd

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HOLT®

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Disclosure Appendix cont'd

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