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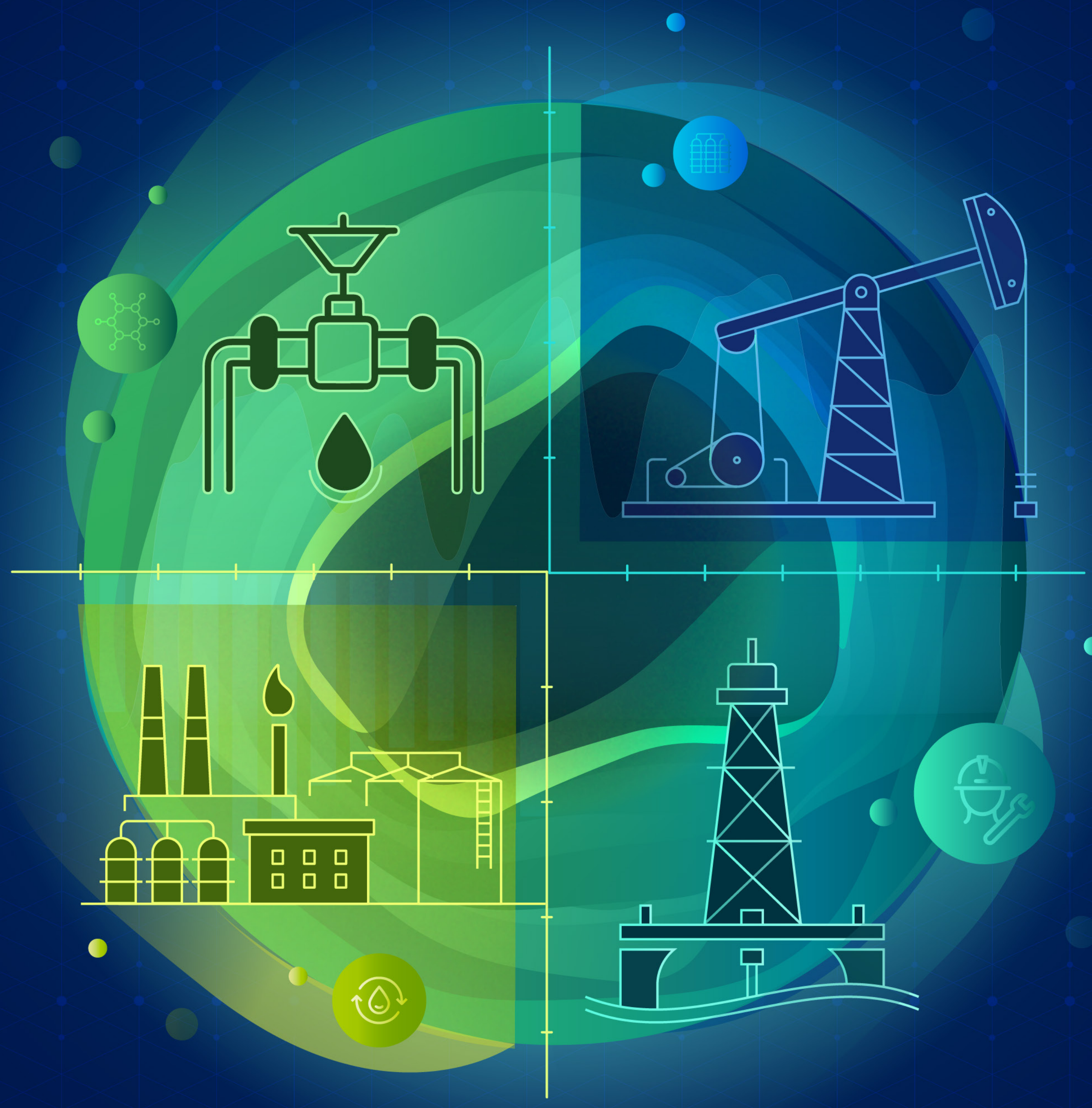

Decoding the O&G downturn

With its breadth of experience in working across the crude oil and natural gas value chain, Deloitte helps clients anticipate the changing landscape and take advantage of emerging opportunities. Deloitte can help clients uncover data-driven insights to inform vision, strategy, and decision making; provide insight into current and shaping trends; assist executives in delivering value to their shareholders; drive operational excellence and prudent capital management across a company; identify, analyze, and perform due diligence for acquisition opportunities; transform business models to capture new growth opportunities; and apply technologies to achieve business goals. Reach out to any of the contacts listed at the end of this document for more information.

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Oil's well?: Divergence and imbalance in the oil and gas ecosystem

Duane Dickson, Andrew Slaughter, and Anshu Mittal

AFTER A DIFFICULT 2015 and 2016, the oil and gas (O&G) industry began showing signs of coming out of the woods by mid-2018, with oil prices recovering to US$85/bbl (Brent). Many industry executives appeared to regain confidence as their companies' financials improved, resulting in growing optimism about 2019.[1]

But then, oil prices surprised everyone by sliding more than 35 percent (Brent) to US$50/bbl in the last quarter of 2018.[2] If fears of oversupply and the three largest oil producers (Russia, Saudi Arabia, and the United States) competing for market share weren't enough, the rise in geopolitical tensions and concerns of a global economic slowdown seemed to have dented the positive momentum built over the past 12–18 months in the oil market. Although the downward slide has now been halted by the November agreement between OPEC and its allies to curb supplies by 1.2 million barrels per day (MMbbl/d), the steep fall amid heightened volatility marks five years of the collapse in oil prices from above US$100/bbl levels in 2014.[3]

How have O&G companies navigated the past five years of the downturn? Did the operational and capital adjustments of O&G companies translate into returns for investors? How have margins and value migrated between O&G segments? Which segment saw the highest fundamental–market divergence? Answering such questions could be essential to gain a complete perspective of the health and prospects of the O&G value chain.

Although many industry pundits have provided piecemeal perspectives across the phases of the downturn and recovery, a consolidated analysis of the past five years and a complete perspective covering the entire O&G value chain could help stakeholders—from executive to investor—make informed decisions for the uncertain future.

With this in mind, Deloitte analyzed 843 listed O&G companies worldwide across the four O&G segments (upstream, oilfield services, midstream, and refining & marketing) in an effort to gain a deeper and broader understanding of the industry. The ensuing research yielded a six-part series, *Decoding the O&G downturn,* which sets out to provide a big-picture reflection of the downturn and share our perspectives for consideration on the future.

In **part one** of the series, we explore the overall O&G industry—its market dynamics, the health of its segments, regional performance, and innovation and talent.

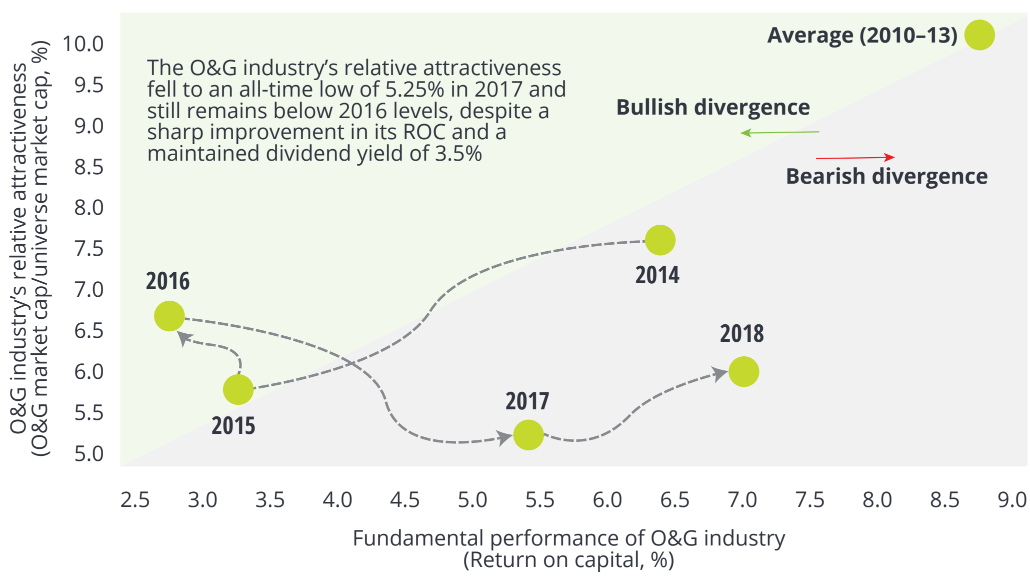
Underperformance or divergence?

In the pre-downturn period (2010–2013), the O&G industry commanded roughly 10 percent of listed companies' market capitalization worldwide at around US$5 trillion (figure 1).[4] By the end of 2018, this figure fell to 6 percent, with only two O&G companies in the top 25 companies of the world by market capitalization.[5] The fall in the industry's attractiveness has come at a time when the global economy expanded by 23 percent to US$70 trillion over the past five years.[6]

Undoubtedly, this reduced attractiveness of the industry is likely because of lower and volatile oil prices and weaker financials of O&G companies. However, the market seems to have disregarded recent efforts of O&G companies to drive capital efficiency in their projects and overall financials. For example, the industry's return on capital, which hit

FIGURE 1

Fundamental—market divergence (overall O&G)



Note: Universe market cap refers to the sum of market capitalization of all the listed entities in the world.
Sources: S&P Capital IQ; Deloitte analysis.

lows of 2.7 percent in 2016, has recovered fast and is today close to pre-downturn levels even in a sub-US$65/bbl price environment (6.9 percent in 2018 as against 7.3 percent in 2013).[7]

Likewise, there has been far less appreciation of the fact that the industry maintained its higher-than-average dividend yield of 3.5 percent (as against 2.4 percent of other industries worldwide) even during the past five years of the downturn. The O&G industry returned more than US$720 billion in dividends between 2014 and 2018, the second highest after the financial services industry.[8] In addition, share buyback programs also transferred cash to shareholders.

Although the market's expectation of sustained weakness in oil prices could explain this bearish divergence, the industry's continued emphasis on operational performance, shareholder distributions, and free cash flows should not be ignored for long—it has the potential to help it to win back investors' trust in the times to come. In fact, the industry is estimated to generate more free cash flow in 2018 than it did in 2013 when a barrel of crude traded at an average of US$112/bbl.[9]

Which O&G segments have driven this divergence?

Imbalance within the O&G ecosystem ...

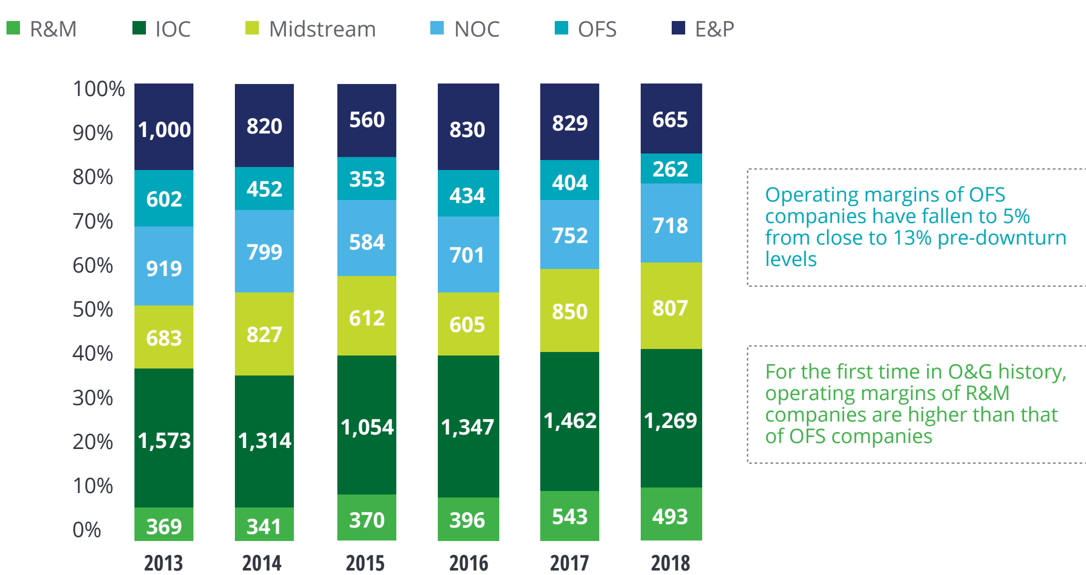
A fit-for-future O&G industry needs a healthy ecosystem of producers, service providers, shippers, and processors and marketers. Without it, the gains of a recovery would likely go to a select few, while losses from a downturn could affect many, potentially impairing the ability of certain segments to attract capital and grow sustainably. While it's normal for value and margins to migrate across the ecosystem, especially in a downturn, the migration in this downturn has been highly skewed and unhealthy for the most part. And this has been our big worry related to this downturn.

Although producers are recovering, and in some cases growing again, many in the oilfield services (OFS) segment continue to struggle for survival. For example, market capitalization of the OFS segment, which is the backbone for both shale growth and offshore revival, has fallen by half to US$262 billion and the entire segment is now less than the size of the biggest supermajor.[10] In fact, currently, only one OFS company figures in the list of top 25 O&G companies worldwide by market capitalization (figure 2).

FIGURE 2

Growing imbalance in the O&G ecosystem

Market cap share of O&G segments (US$B)



Sources: S&P Capital IQ; Deloitte analysis.

Conversely, operating margins in what have historically been the least lucrative O&G businesses, downstream and midstream, have shot up higher than what an average integrated producer and service company makes. For example, downstream margins of 6 percent are now higher than the 5 percent margins of a service company. Similarly, a midstream company's fees/spread per unit of volume transferred has remained flat at a minimum, while the underlying commodity's price has fallen by more than 50 percent during the downturn.[11]

Today's lopsided producer–contractor–customer relationship, or the health of the O&G ecosystem, means that stabilization in the industry may still be a few years away, or that a big rationalization could play out.

... with a high regional variability in valuations

Unlike earnings, which have remained highly variable, the more stable, tangible assets provide a clearer picture of the industry's performance and attractiveness. The industry has remained undervalued in general, with the market valuing O&G companies significantly below their book value or replacement cost at around 0.8 times (enterprise value/total assets, see figure 3).

At a regional level, however, EV/asset multiples have varied significantly despite O&G being a commoditized industry. In fact, there is 20–40 percent divergence in the valuation of companies/segments by regions. Although North America-based O&G companies have seen a fall of 10 percent in their valuation multiple, investors still generally value them close to their replacement cost. On the other hand, Latin American and European O&G companies have largely seen a flat to positive change in their valuations over 2013 levels.

Similarly, most private integrated oil companies (IOCs) and state-owned national oil companies (NOCs), especially outside North America, have received much lower valuation despite their stable integrated and/or diversified structure. On the other hand, OFS has turned into the least valued

FIGURE 3

Rising valuation disparity across segments and regions

Enterprise value by assets (2018 vs 2013)

■ 2018 values below 2013 values ■ 2018 values similar to 2013 values ■ 2018 values above 2013 values

	US & Canada	Latin America	Europe	APAC	MEA
IOC & NOC	0.9 (1.1)	0.8 (0.7)	0.6 (0.6)	0.6 (0.8)	0.2 (0.3)
Pure-play E&Ps	0.9 (1.0)	0.7 (1.3)	1.3 (1.3)	0.7 (0.9)	0.6 (0.9)
OFS	0.8 (1.3)	0.5 (0.3)	0.6 (0.9)	0.7 (1.1)	0.8 (0.8)
Midstream	1.3 (1.3)	1.0 (1.2)	0.8 (0.7)	1.1 (1.1)	1.0 (1.1)
Pure-play R&Ms	0.9 (1.0)	0.7 (1.3)	0.9 (0.6)	0.8 (0.6)	0.8 (0.8)
Overall by regions	1.0 (1.1)	0.8 (0.7)	0.6 (0.6)	0.7 (0.8)	0.6 (0.7)
Overall	0.8 (0.8)				

Regionally, integrated companies and pure-play E&Ps have the highest differences in their multiples

OFS is now the least valued O&G segment; Latin American OFS companies gained traction

North America-origin O&G companies still command the highest valuation multiple

Still 20–40% difference in the valuation of O&G companies worldwide

Note: MEA stands for Middle East and Africa region.
Sources: S&P Capital IQ; Deloitte analysis.

O&G segment, while the multiple of downstream companies worldwide hasn't expanded like their margins over the past few years.

One can conclude that investors don't seem to be buying into the O&G industry just to play price and margin cycles in pure-play businesses/regions or to park money in the safety of integrated structures. Although company-specific strategies and results that provide an upside beyond simple oil price increase could dictate investors' interest, such high differences in valuations in an improved macro and oil price environment could set the stage for mega- and cross-regional M&A in the O&G industry.

Employment and innovation have somewhat resisted the downturn

The fall and heightened volatility in oil prices have troubled many executives, upset investors, and led to unforeseen migration of value and margins within the O&G industry. But what has been the impact of this downturn on innovation and the workforce in the industry? Did the downturn, along with automation, affect hiring in the industry? Did O&G companies favor a manufacturing and mass production mindset over technology- and data-led optimization?

Although the industry's overall employment levels fell during the downturn, 2017 saw a recovery in headcount, and the current employment numbers of 4.5 million are only 1 percent below the 2013 numbers. The reason: About 300,000 layoffs in oilfield services, pure-play E&Ps, and private IOCs were largely offset by a hiring of 255,000 employees by NOCs and pure-play midstream and downstream companies (figure 4). Although redistribution of jobs between the segments/regions accelerated, especially those that are analytics-based, the industry's volume growth and innovation seem to have supported overall employment by creating new and more work profiles.[12]

Similarly, the 16 percent fall in the industry's research and development (R&D) expenditure to US$13.5 billion has been much less than its curtailment of capital expenditure. Impressively, the hardest-hit OFS segment maintained its R&D spending of US$3.4 billion and downstream registered its highest R&D spend in 2017. On the other hand, surprisingly, most large IOCs and NOCs have reduced their absolute R&D spend despite the established role of technology in lowering breakevens during the downturn. Although internally generated innovation is generally considered important, a balanced and united focus on innovation is also critical as organizations must often complement their internal innovation capabilities with solutions, ideas, and technologies from external partners and vendors.[13]

Lessons from the downturn

The lower-for-longer environment seems to have shaped the industry in its own unique way, and is likely to continue to do so in the near future. Although company-specific strategies that provide an upside beyond oil price and generate sustainable efficiencies will often determine investors' interest, a few pointers could help the industry to respond favorably to the new reality:

- O&G companies with **fit-for-future portfolios** should effectively position themselves as a strong value/yield investment and strongly talk about their progress in growing free cash flows, maintaining shareholder distributions, and increasing their ROC to investors.[14]

- Advantaged segments and players should **bring a balance to today's lopsided contractual relationships** by sharing in the economics of efficiencies created by contractors and vendors, thus providing a win–win relationship.

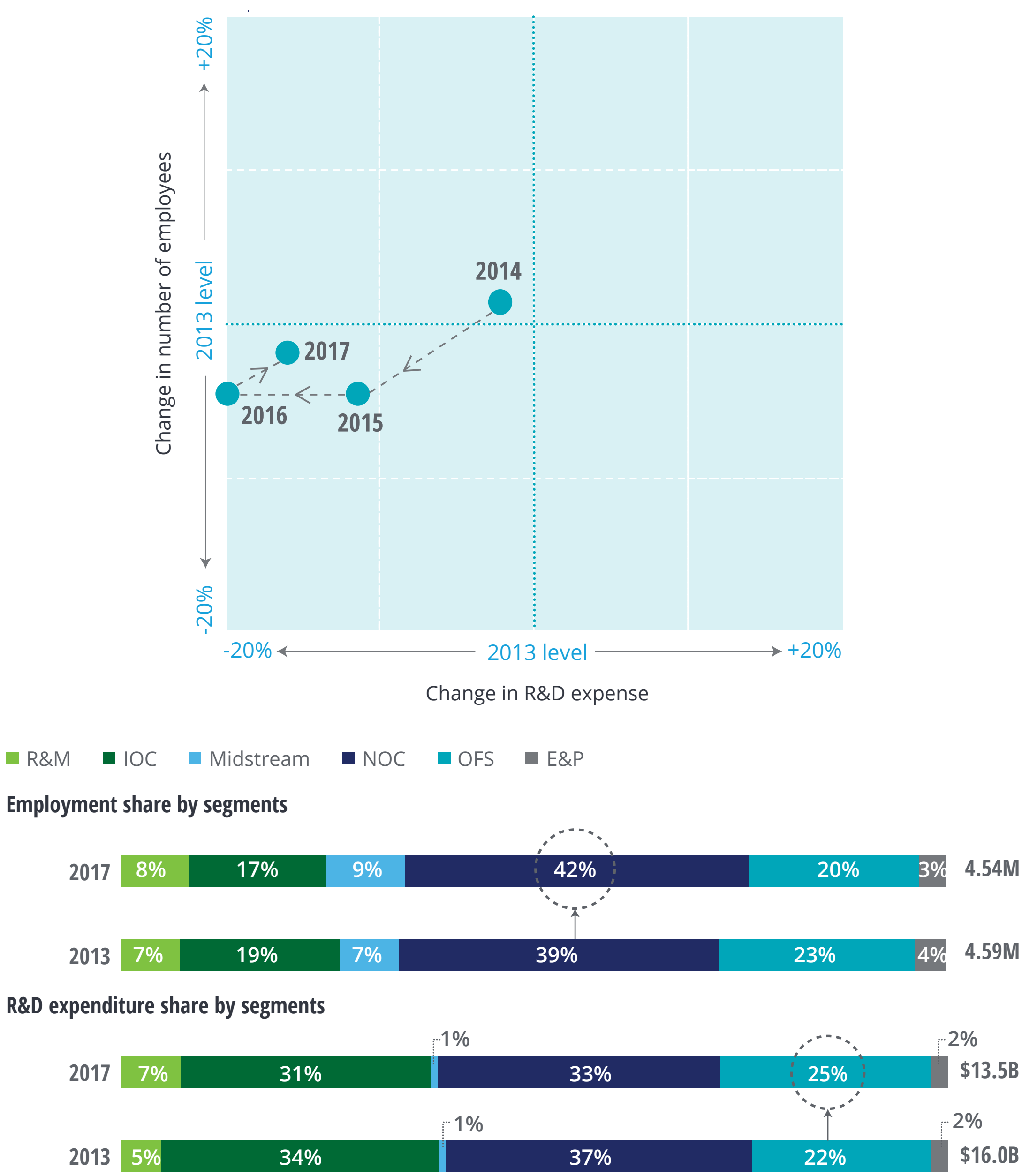
- O&G companies across the value chain should **stay invested in harnessing capabilities of the new-age workforce and remain open to accelerated innovation** happening outside the industry as well.

Volatility has always been the name of the game in the O&G industry. However, the past five years have forced many companies to rethink their strategies. A strong understanding of the downturn could therefore help companies determine where to play and how to win. In the next few articles, we will examine all O&G segments through the lens of the downturn. Explore the entire *Decoding the O&G downturn* series to understand how you can thrive amid uncertainty.

FIGURE 4

Employment and R&D resisting the downturn

O&G employment and R&D trend: Yearly change over 2013 level



Sources: S&P Capital IQ; Deloitte analysis.

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Exploration & production: Overcoming barriers to success

Anshu Mittal and Thomas Shattuck

WALL STREET AND its global equivalents weren't kind to pure-play upstream and integrated oil companies when oil started falling in 2014. Nor did they reward companies enough when oil began its recovery from the lows of US$26/bbl in 2016.[1] Although optimists may caution about reading too much into share price movement solely and will point toward improving productivity of companies, there seems to be more to this than meets the eye.

As against piecemeal and situational adjustments, the market expectations of seeing a deeper portfolio assessment, management, and restructuring by oil and gas producers across the cycles appear to reiterate our findings from *The portfolio predicament* paper published in early 2018. What can companies learn from some of the best performers in this downturn to deliver success in the eventual upturn?

Underperformance in the recovery ...

Between 2014 and early 2016, a free fall in crude oil prices from above US$100/bbl to US$26/bbl led to a massive breakdown in the financial performance of many oil and gas producers and even threatened their long-term sustainability.[2] More than 110 North American producers, for example, filed for bankruptcy protection by the end of 2016.[3] After this steep fall, the industry began its struggle to rebalance oil markets and its long march to the "new normal" of sub-US$80/bbl.

Luckily, efforts started paying off, as oil prices recovered gradually and attained the new normal by mid-2018. But did this recovery bring companies' financials back in the black and pare the losses of investors? Although the number of bankruptcy filings reduced significantly in the past two years (2017

Although many industry pundits have provided piecemeal perspectives across the phases of the downturn and recovery, a consolidated analysis of the past five years and a complete perspective covering the entire O&G value chain could help stakeholders—from executive to investor—make informed decisions for the uncertain future.

With this in mind, Deloitte analyzed 843 listed O&G companies worldwide with a revenue of more than US$50 million across the four O&G segments (upstream, oilfield services, midstream, and refining & marketing) in an effort to gain a deeper and broader understanding of the industry. The ensuing research yielded a six-part series, *Decoding the O&G downturn,* which sets out to provide a big-picture reflection of the downturn and share our perspectives for consideration on the future.

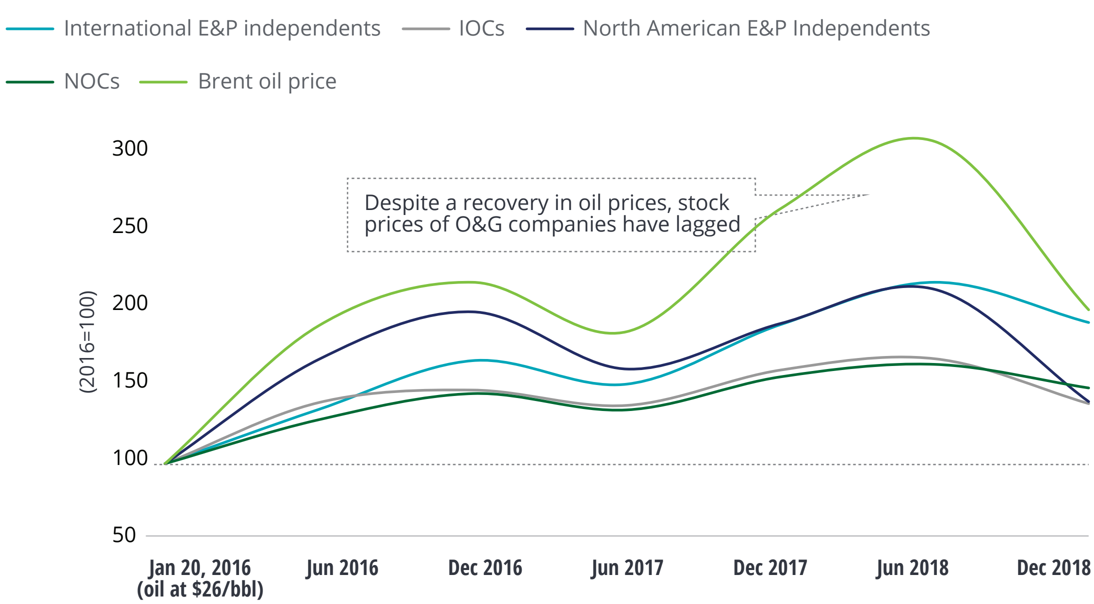
In **part two** of the series, we explore the state of the upstream O&G segment—assessing its overall performance, mapping actions and strategies of companies with their shareholder returns, and re-emphasizing the importance of having a future-ready portfolio.

and 2018), 53 North American upstream companies still filed for bankruptcy in the improved oil price environment.[4] Further, current stock prices of 30 percent of listed pure-play and integrated companies worldwide (with a combined market capitalization of US$550 billion) are still trading below their early 2016 levels, when oil hit at a historic low.[5]

The market, which was brutal in the initial phase of the downturn, hasn't been generous in the follow-up phase of recovery. All the four company groups (North American pure-plays, international independents, integrated oil companies, and national oil companies) have underperformed oil prices by 10–50 percent, especially North American upstream companies (figure 1).

FIGURE 1

Lagging performance



Sources: S&P Capital IQ; Deloitte analysis.

... that too when companies were the most efficient

Underperformance in a recovery phase can be puzzling, especially when the worst seems to have passed. Is it because the companies didn't do enough to course-correct themselves and adjust to the new energy reality? Were they not focused on improving their financials and growing shareholder returns? The metrics of progress, however, suggest otherwise (figure 2), questioning the industry's worst critics and surprising the optimists over the sustained thumbs-down by the market.

In terms of dividends and share buybacks, the four groups returned more than US$300 billion to shareholders over the past three years (2016–2018). Even the most stressed North American independents returned close to US$25 billion in 2018. Likewise, operationally, North American independents reduced their operating costs by more than US$15/boe to about US$35/boe and they are now producing 16 million barrels of oil a day, about a third more than in 2014, with almost half the number of rigs.[6] And the industry achieved all these gains with a much lower capital expenditure, or capital intensity.

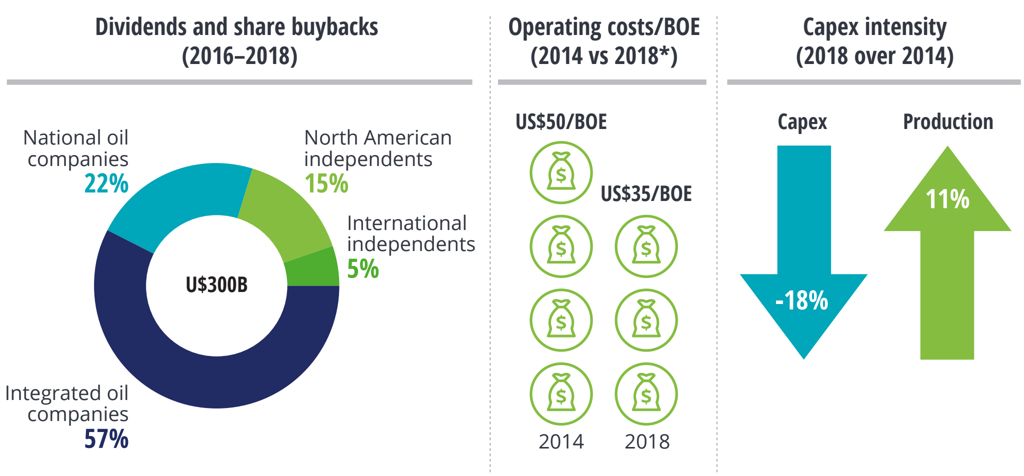
In today's efficient markets, the possibility of investors and analysts remaining oblivious to these ongoing operational gains of upstream companies is minimal. As shareholder returns are seen as the barometer of a business's success, the market's thumbs-down can't be without reason. Is there a specific financial outcome resulting from these operational gains that didn't go down well with the market?

The sum is greater than the parts

A fast-growing business—here, growth in O&G reserves and production—typically drives up the shareholder value of a company. However, our analysis of all listed pure-play and integrated oil companies worldwide suggests that less than 30 percent of high-growth upstream companies outperformed the broader S&P 500 index in an improved oil price environment over the past three years (figure 3).[7] In today's oversupplied market and short-cycled shale projects, it seems that the market is cautious on companies with an all-out growth model or companies with a growth-at-all-costs mindset.

FIGURE 2

Recognizing efforts



*Operating costs/BOE consist of pure-play upstream companies.
Sources: S&P Capital IQ; Deloitte analysis.

But then again, upstream companies with conservative balance sheets also haven't improved their valuations significantly. Only 38 percent of the listed upstream companies with a leverage ratio of less than 25 percent have outperformed the broader S&P 500 index since 2016.[8] The result doesn't minimize the importance of having a stronger balance sheet. But it appears to reiterate the importance of having the right balance of growth and flexibility and weakens the notion that the strongest balance sheets translate into the strongest portfolios.

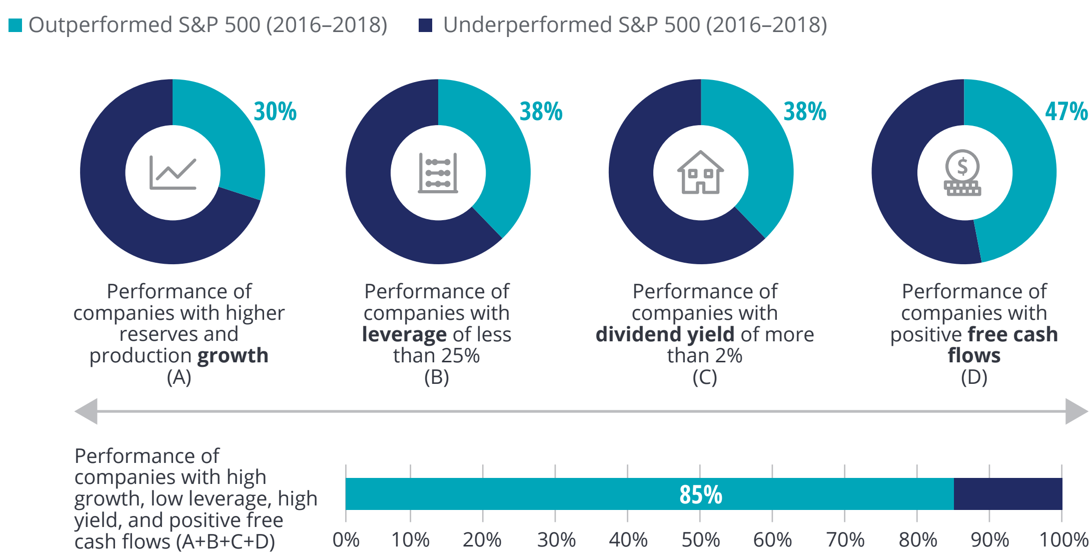
Paying a growing dividend, along with measured buybacks regularly, have been central to the cash flow allocation strategy of many upstream companies, especially those with strong balance sheets. In fact, about one-third of the upstream companies worldwide in our sample set had a dividend yield of more than 2 percent (S&P 500 dividend yield) in 2018. But less than 40 percent of these high-yield upstream companies have outperformed the broader index, upending the primary objective of growing shareholder returns through these payouts.[9] A similar problem of low stock prices despite high dividends is apparent in the US midstream segment, which is facing a capital conundrum (for more details, read our previously published paper, *Back to basics: Solving the capital conundrum of US midstream companies*).[10]

Free cash flow, to a large degree, explains the challenge faced by many upstream companies in balancing their priorities around growth, profitability, capital investment, and shareholder returns. Only 25 percent of companies in our sample set reported positive free cash flows in the past three years, and about 47 percent of these consistent cash producers outperformed the broader index.[11] Although a consistent free cash flow tends to have a stronger correlation with stock price movement, relative to other metrics, the market seems to be expecting a more complete balancing of books/priorities from upstream companies. And attaining this balance has never been tougher.

Thus, only a handful of companies have got closer to attaining the balance (i.e., growth without impacting leverage, payouts, and free cash flows) and most of them (about 85 percent) have outperformed the broader S&P 500.[12] It is clear that the market wants to see healthy performance overall, driven by a future-ready portfolio from upstream companies. A future-ready portfolio is one that typically shields itself from probable price downsides, best sustains performance in a lower and volatile oil

FIGURE 3

The sum is greater than the parts



Sources: S&P Capital IQ; Deloitte analysis.

price environment, and scales up most quickly and efficiently when opportunity arises.[13]

Lessons from the downturn

Our bottom-up analysis of 32,000 global assets of leading O&G companies revealed the below characteristics and traits of companies with the strongest future-ready portfolios. Although each portfolio should be tailored to match each organization's financial and operational capabilities and its strategic priorities, the following traits of most portfolio leaders can serve as guiding principles for other companies to consider when transforming their portfolio (for an in-depth analysis on these traits, read *The portfolio predicament: How can upstream oil and gas companies build a fit-for-the-future portfolio?*).

- **Follow a consistent strategy and actively manage portfolio:** Companies that follow a consistent strategy, either of concentration or diversification, but maintain a healthy pace of change and churn in their portfolio have consistently outperformed others. Being purposeful can be destructive, and doing nothing does not seem like an option anymore.

- **Prioritize operational excellence over location:** Companies that prioritize "how" before the "where" or capitalize on their strengths over just acquiring acreages in trending rocks and basins often have a higher probability of delivering profitable growth across price decks.

- **Manage resources by focusing on investment cycles:** Outperformers typically optimize their resource portfolio using the lens of cash and capital cycles, rather than treating investment cycles as an afterthought. In fact, building investment flexibility in a portfolio has potentially never been more important.

- **Attain a balanced fuel mix:** Many performers closely follow the changing demand patterns in both the fuels and strive for a fairly stable oil–gas mix, where their exposure to natural gas is important but not central yet to their success.

A comprehensive high-grading of the entire portfolio, as against a piecemeal situational adjustment, and a consistent communication of progress against this strategy to the market, could overcome the systemic underperformance experienced by the segment. Considering upstream is just one part of the changing O&G ecosystem, upstream strategists could benefit from gaining perspectives across the O&G value chain. Explore the entire *Decoding the O&G downturn* series to gain a 360-degree view of the industry.

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Oilfield services: Caught in the cycle

Anshu Mittal and Andrew Slaughter

THE OILFIELD SERVICE (OFS) segment is the backbone of the upstream O&G industry, helping producers overcome technological challenges associated with offshore development and commercialize the newly found shale resource through new technologies such as hydraulic fracturing. The segment, despite its critical role, seems to be struggling to recover from the downturn, and is witnessing the highest disconnect with the ongoing supply boom. Since 2015, for example, over 170 OFS companies have already filed for bankruptcy.[1] Why and where did things go wrong for this segment?

Although many industry pundits have provided piecemeal perspectives across the phases of the downturn and recovery, a consolidated analysis of the past five years and a complete perspective covering the entire O&G value chain could help stakeholders—from executive to investor—make informed decisions for the uncertain future.

With this in mind, Deloitte analyzed 843 listed O&G companies worldwide with a revenue of more than US$50 million across the four O&G segments (upstream, oilfield services, midstream, and refining & marketing) in an effort to gain both a deeper and broader understanding of the industry. The ensuing research yielded a six-part series, *Decoding the O&G downturn*, which sets out to provide a big-picture reflection of the downturn and share our perspectives for consideration on the future.

In **part three** of the series, we explore the state of the oilfield service segment—assessing its overall health, identifying possible reasons behind its underperformance, analyzing its changed margin profile, and comprehending the role of large service companies in this downturn.

A boom that turned into doom

Global liquids (crude oil and natural gas liquids) and natural gas supplies grew by 11 percent in the downturn, the highest five-year supply growth in the O&G history.[2] Increased drilling, completion, or production of resources, however, didn't translate into more business for OFS companies. In fact, the segment's revenue fell by 20 percent during the downturn, due to both reduced activity and a downward pricing structure (figure 1).[3]

Worryingly, the segment's negative top-line growth came along with a severe contraction in its margins. The OFS segment, for the first time in its history, reported negative net income for four consecutive years, with a cumulative loss of about US$96 billion.[4] Even in 2017 and most of 2018, when oil prices were recovering and the completion activity in shales was at the highest level, the segment reported a net loss.

The result: From one of the most heavily owned and highly valued O&G segment in the run-up to the shale boom, OFS turned into a liability for its investors in the downturn where they lost US$300 billion of invested capital—by the end of 2018, the entire size of the global OFS segment was less than the size of the biggest supermajor.[5] In other words, the O&G supply boom has turned into doom for OFS companies and their investors.

Gains became losses

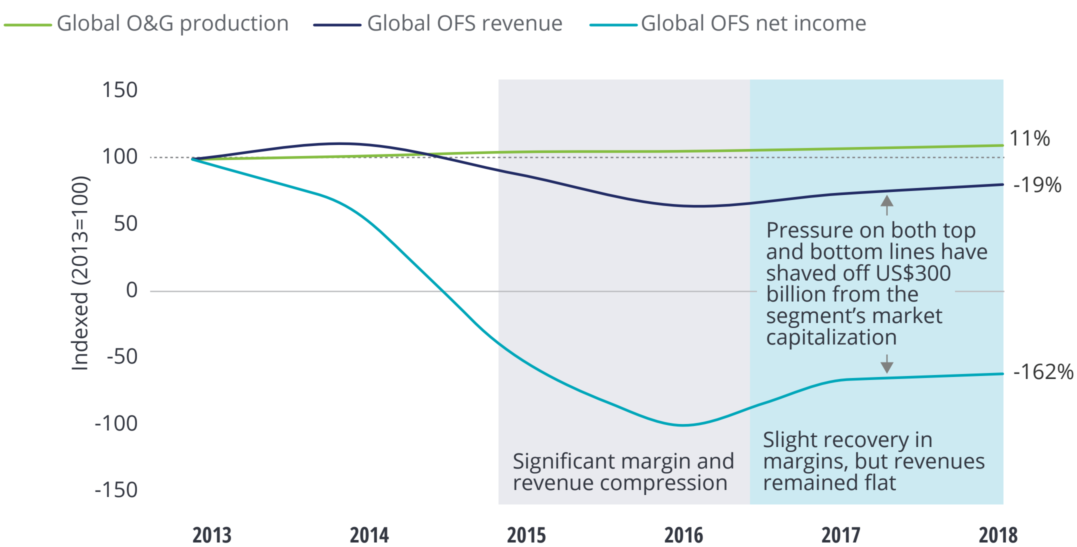
The collapse in oil prices challenged the economics of likely every operator, especially those operating in the highly competitive US shale market. Their challenges of reducing cost and improving productivity became an opportunity for service companies as that meant selling enhanced well designs and larger completion jobs.

A right mix of innovation, determination, and desperation on the both sides to sustain their business got them together, and the results started flowing. Average length of laterals and volume of proppants and fluid increased by 35 percent to 50 percent during the downturn, supporting a 50 percent rise in US O&G production and 50–60 percent fall in well-head breakeven.[6]

However, gains have skewed toward operators as more business from high-intensity completion

FIGURE 1

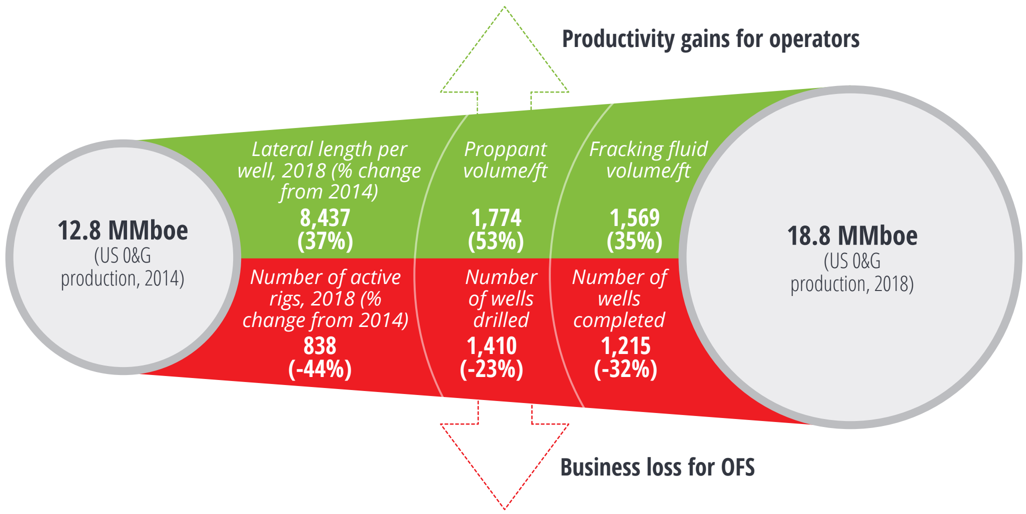
O&G supply boom turned into doom



Sources: EIA; S&P Capital IQ.

FIGURE 2

Gains became losses



Sources: EIA; Rystad Energy.

jobs came at an increased cost of consumables and lower contract rates for service companies. On the other hand, greater use of technology (multi-pad drilling) and increased well productivity reduced requirement and day-rates for rigs and wells. For example, the average number of rigs deployed in the United States dropped by 45 percent, while the number of drilled and completed wells dropped by 25–30 percent during the downturn (figure 2).[7]

In short, efficiency and productivity gains led by the combined efforts of operators and service companies turned into losses for OFS companies. When they were just getting hopeful of regaining their business and pricing power in an improved oil price environment, a steep fall in oil prices to below US$55/bbl (WTI) in late 2018 dragged them down even further.[8]

The imbalance of volume over value

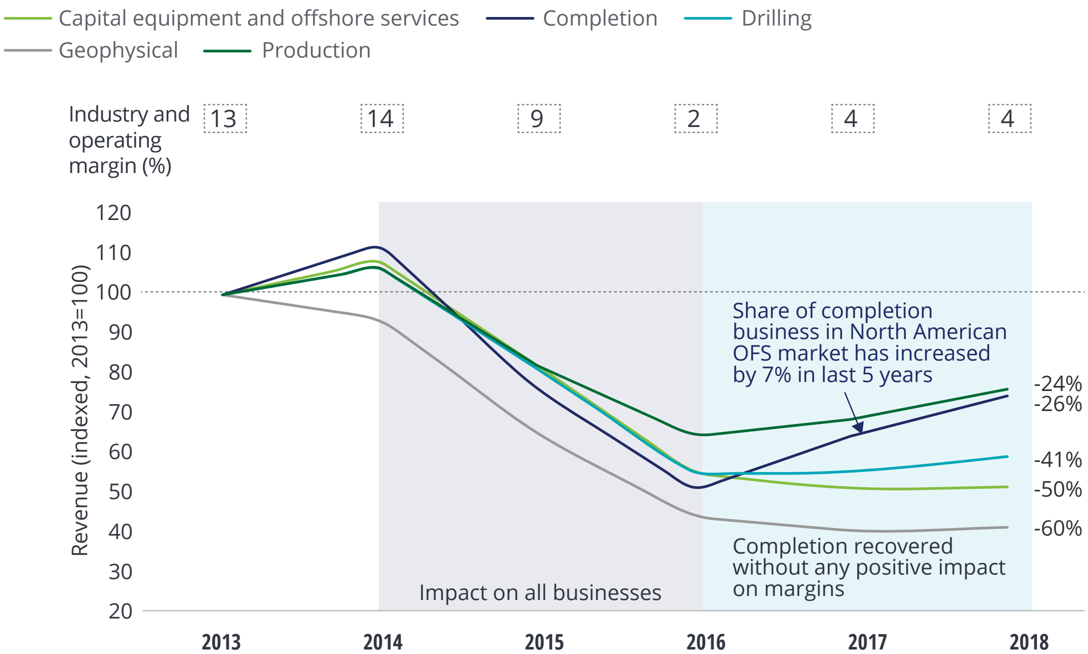
Although shales have broken the linear relationship between O&G production and OFS growth (i.e., before the development of shale resources, for more production, more rigs needed to be deployed and more drilling needed to be done), the completion business has kept the top line of OFS companies at a respectable level. In 2017 and 2018, in fact, it was the only major business category that registered a sizeable revenue growth of 49 percent.[9]

The noticeable revenue growth in the completion business, however, is largely driven by rising share and cost of consumables (e.g., proppants and fluids) procured from third parties by service companies and billed to operators, as against a revenue expansion entirely led and owned by service companies. For example, proppants and fluids now constitute more than 70 percent of a typical well's completion cost in Delaware.[10] And, the cost of frac sand has more than doubled over the past 12–18 months in the Permian.[11]

The result: The completion business has altered both the top line and margin profile of US service companies. Our analysis reveals a 10–12 percent contraction in the segment's operating margin profile because of the oversupplied and highly competitive state of the completion business, exacerbated by the falling share of high-margin businesses such as geophysical services and offshore contract drilling (figure 3).

FIGURE 3

Imbalanced growth in business volume and value



Sources: Spears & Associates, *Oil market report*; S&P Capital IQ.

A missed opportunity?

History suggests that a fragmented industry in distress often paves the way for consolidation; large and financially sound players monetize such situations to strengthen their bargaining power and diversify their growth/risks. How have large OFS players evaluated and addressed fragmentation in the industry? Have they expanded their economies of scale (market share) and economies of scope (breadth of offerings) during the downturn?

Surprisingly, the OFS segment has never seemed as fragmented as it is today, five years into the downturn. OFS has now more than 1,000 listed and private companies worldwide and only 6 have a market capitalization of more than US$10 billion. And, the market share of the top 25 OFS companies in the overall segment's revenue has been at its lowest level of 52 percent, a fall of 4 percentage points from 2014 (figure 4).

In terms of scope, the story is only slightly better. Although the revenue share of nonmajor/secondary businesses has grown by 3 percentage points for the top 25, primary businesses still constitute about 75 percent of their revenue mix. Businesses such as downhole drilling tools, floating production services, and contract compression services seemed least impacted in the downturn but remained under-owned by large service companies.

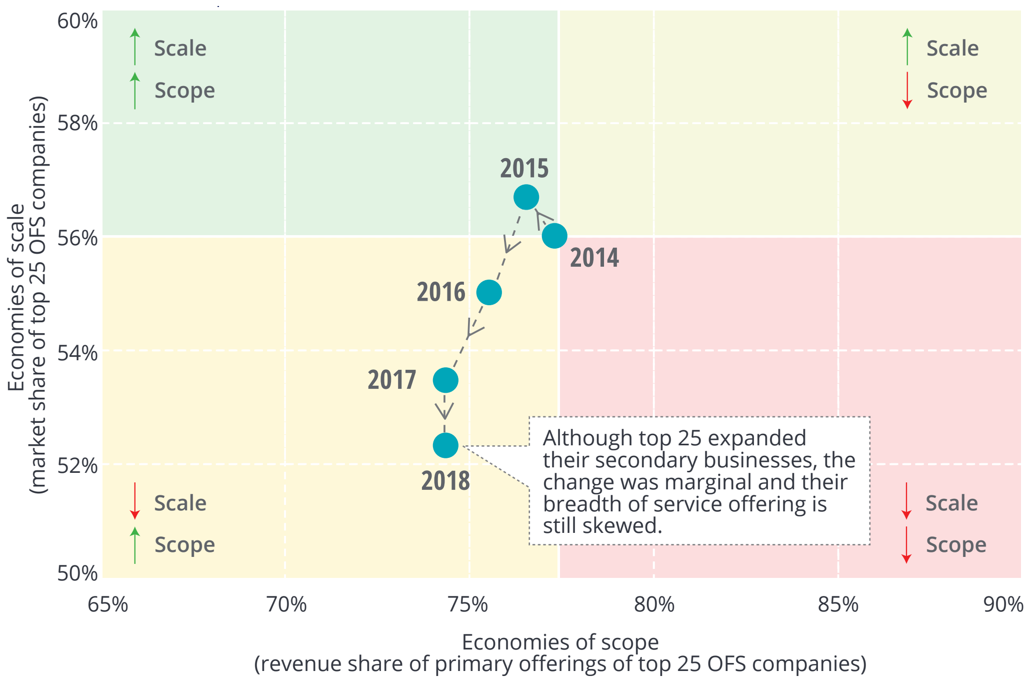
With only US$20 billion of M&A activity in 2018, would the segment have fared better if there was a consolidation?[12] Although results are unclear—because even a few mega-mergers over the past few years are yet to deliver on stated synergies—alliances that reduced total "ownership cost" for both the parties, offered integration value to clients, provided cost and schedule certainty, and reduced interface risk/time of operators seem to have fared well. After a muted M&A activity, could there be a big M&A wave or consolidation in the offing?

Lessons from the downturn

Continuing oil price volatility, the downside of efficiency gains at the operators' end, and a highly

FIGURE 4

A missed opportunity



Note: Primary offering of a company represents top 2 business segments by revenue.
Source: Spears & Associates, *Oil market report*.

fragmented market continue to present unprecedented challenges to the OFS segment. Growing cyclicality in its asset utilization, commoditization of fees, and industrialization of processes suggest that the segment's path to recovery may not be smooth either. Although challenges are unique to each company and thus require tailored solutions, the following considerations could help bring a balance:

- Rapid changes in business dynamics, especially in the competitive hydraulic fracturing and capital-extensive offshore markets, could require **higher operational agility** and a **nimble-and-timely scalability** (scale up, scale down, and even scale out) approach across the value chain of their offerings.

- Overcoming the consequences of efficiency gains may require greater acceptance of **performance-based contracting**. This is likely to happen only if OFS companies can display the additional value they are bringing to operators while distinguishing themselves technologically and demonstrating their grip over the supply chain.

- With operators moving toward flexible investments and capital-light models, OFS companies should explore **new forms of alliances and partnerships**, even with operators and vendors, to reduce their "total cost of ownership" of assets and gain back some control over their rising "variable cost."

Times are tough, but we are optimistic that OFS companies can thrive amid uncertainty. A healthy OFS segment is an important component for the success of the entire upstream business. Considering the segment's broader impact, having a perspective across the O&G value chain can be critical for OFS strategists. Explore the entire *Decoding the O&G downturn* series to gain a 360-degree view on the industry.

Endnotes

1. Haynes and Boone, *Oilfield services bankruptcy tracker*, January 7, 2019.
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Midstream: Charting a new course amid market dynamism

Vivek Bansal and Anshu Mittal

THE MIDSTREAM SEGMENT is not only a key element in the O&G industry's biggest supply story but also appealing to many energy-focused investors for its consistent free cash flow generation in the past. However, the segment, despite its critical role and stable fee-based business model, has struggled to create additional wealth for its shareholders during the downturn as well as the recent upturn in 2017–18. The short-cycled production profile of shale resources and altered trade flows and routes have brought new challenges to this segment, keeping it under pressure. How have various sub-segments in the midstream segment responded to this complex business environment?

Investors proceed with caution

A supply boom and strong demand for both crude oil and natural gas have enabled a highly advantaged business environment for midstream companies worldwide. Global O&G supply grew by 11 percent, while demand expanded by 8.5 percent over the past five years.[1] Robust volume expansion (especially emergence of LNG and the coming of new supply centers) and a stable fee-based business, as expected, explain the strong growth in both top and bottom lines of midstream companies worldwide (figure 1). In fact, the companies paid dividends to the tune of US$19 billion while keeping their leverage ratio flat at 51.5 percent.[2]

Although many industry pundits have provided piecemeal perspectives across the phases of the downturn and recovery, a consolidated analysis of the past five years and a complete perspective covering the entire O&G value chain could help stakeholders—from executive to investor—make informed decisions for the uncertain future.

With this in mind, Deloitte analyzed 843 listed O&G companies worldwide with a revenue of more than US$50 million across the four O&G segments (upstream, oilfield services, midstream, and refining & marketing) in an effort to gain both a deeper and broader understanding of the industry. The ensuing research yielded a six-part series, *Decoding the O&G downturn,* which sets out to provide a big-picture reflection of the downturn and share our perspectives for consideration on the future.

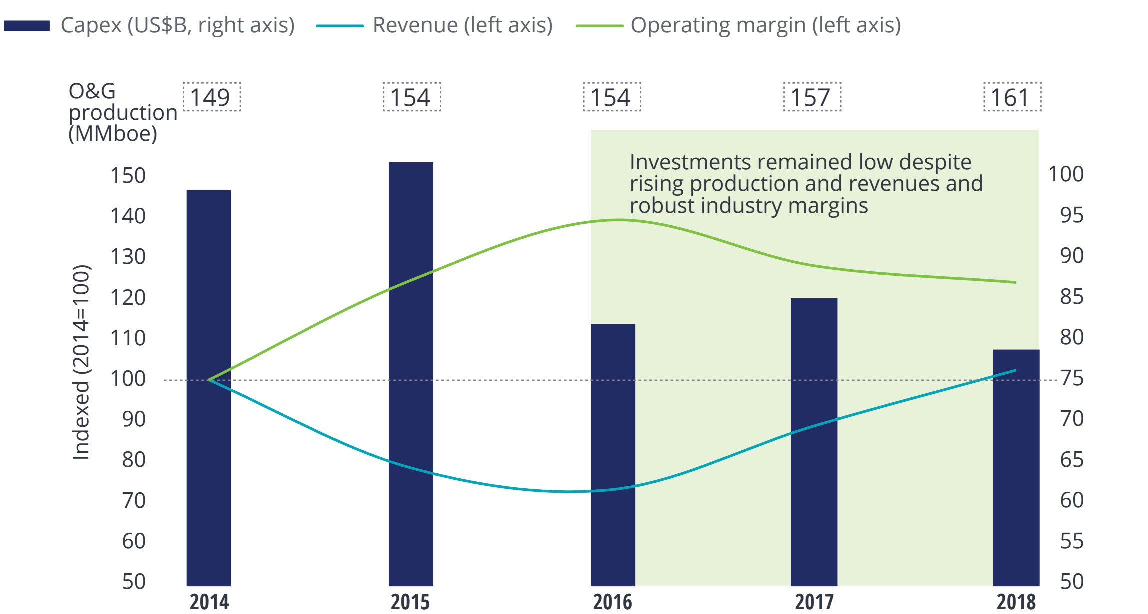
In **part four** of the series, we explore the state of the midstream segment—assessing its overall health, identifying possible reasons behind its flat performance, analyzing its investment profile, and comprehending the importance of revamping commercial and capital arrangements in this volatile market environment.

However, the picture is quite different on the investment and value creation front. The midstream sector has remained cautious even as upstream players expect future growth. This seems clear from falling midstream investments—midstream capex CAGR across all regions has remained in the range of -7 to -11 percent during the past four years.[3] And while investors have acknowledged the discipline exhibited by companies, they expect a much faster pace of infrastructure growth to absorb growing supplies and meet latent demand—the market capitalization of global midstream companies in 2018 was 4 percent lower than in 2014.[4]

Unlike in other O&G segments and industries, investors in midstream typically use the common lens of a yield-focused mindset to evaluate the segment across the globe. However, changed supply conditions on the upstream side and varying

FIGURE 1

Investments remained low despite strong fundamentals



Sources: S&P Capital IQ; Deloitte analysis.

infrastructure needs and regulations of countries could require a deeper assessment by regions and a more differentiated view by investors. While the US midstream sector seems to find it challenging to manage capital cycles in a more dynamic shale world, non-US companies are facing issues that are unique to the part of the value chain they operate in. And given the criticality of midstream infrastructure, even short-term uncertainty in resolving these challenges could pose risks to future O&G volume growth.

US midstream: Both reactive and proactive strategies fail to deliver

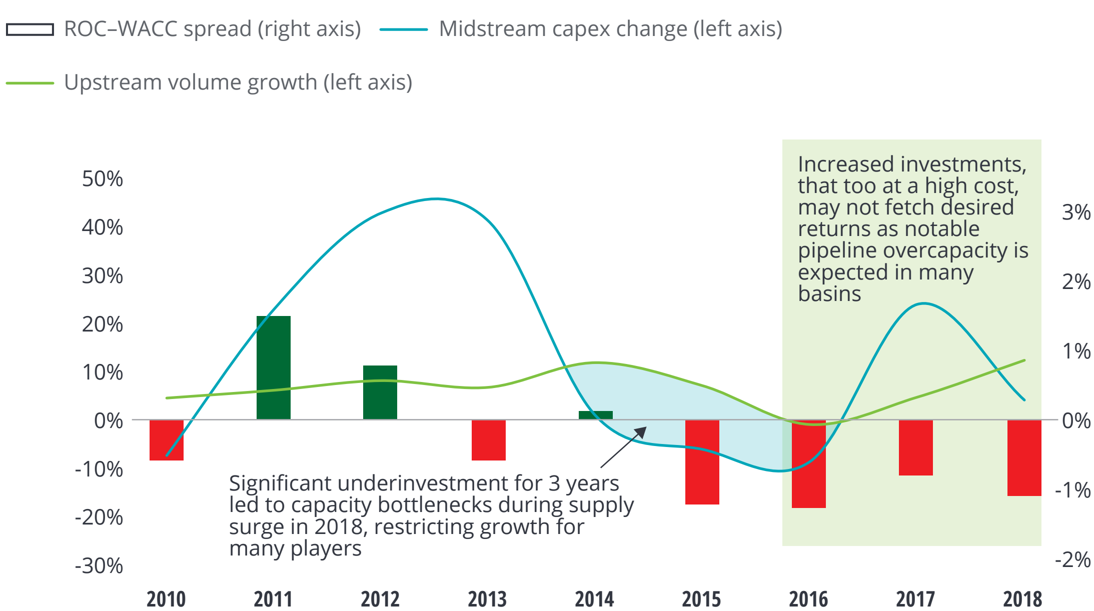
After the oil downturn started in mid-2014, midstream companies, skeptical of the sustainability of then high-cost US shale production, broke the linear relationship with upstream investments and slashed their capital programs. Despite realizing that they were risking their future growth, most midstream companies reduced their investments seeing rising cost of capital, falling returns, and high distribution commitments. But then, shale companies surprised them by delivering phenomenal volume growth even in a low-price environment. However, because of the time taken to build pipeline infrastructure, midstream companies could not catch up. The result: Many midstream companies lost notable volume growth potential as capacity bottlenecks pushed E&Ps to either delay completions or explore other transportation options.

Realizing that being reactive was not working, most midstream players then followed a proactive approach and increased their spend on infrastructure development by 25 percent in 2017 despite their high cost of capital: ROC (return on capital)–WACC (weighted average cost of capital) spread averaged around -1 percent when midstream investments went up in 2017.[5] Further, visible shale volume growth appeared to entice them to maintain their high capex in 2018 as well (figure 2). But this growth came with a high cost of capital, and thus lower margins.

With oil prices falling and volatility returning in late 2018, now, there is a risk of supply growing less than anticipated or planned for. Although shale production has consistently surprised to the upside,

FIGURE 2

Managing high-cost investments in a dynamic shale world remains a challenge



Sources: S&P Capital IQ; Deloitte analysis.

some estimates caution against possible pipeline overcapacity of 15–40 percent over the next five years in some shale plays.[6] This could explain the underperformance of US midstream companies, where both reactive and proactive investment strategies have failed to deliver in a highly dynamic shale environment.

One may rightly argue that midstream investments self-balance over a period of time, and the lag or lead in infrastructure growth is intrinsic to this business. But shale's dynamism and intensifying competition likely require a much closer alignment of upstream growth and infrastructure planning in the United States.

Non-US midstream: Bound by regional differences

Global growth in natural gas as a fuel for the future and altered trade flows due to the shale boom have had a profound impact on international

FIGURE 3

Investment and performance issues in midstream sub-sectors pose a threat to future O&G trade growth

Above 2014 levels — Below 2014 levels

	Region	Revenue (US$ billion)	Margin (%)	Market cap. (US$ billion)	Capex (US$ billion)
Distribution	Asia Pacific	86	11	140	6
Distribution	Europe	30	10	31	2
Distribution	Latin America	9	22	19	0.7
Distribution	MEA	2	3	1	-
Shipping	Europe	16	6	13	2
Shipping	Asia Pacific	16	6	13	1
Shipping	Latin America	6	13	7	3
Shipping	MEA	2	29	6	0.4

- Outside North America, midstream investments, especially on the natural gas distribution front, are very low, posing a threat to the anticipated natural gas and LNG growth

- Drastic margin contraction and loss of investors' wealth in the shipping business, due to trade disruption and energy transitions, pose a significant threat to capacity planned for exports

Notes:
1) Values mentioned against each parameter represent either FY 2018 or last twelve months' data based on reporting cycles of various companies.
2) Margin refers to weighted average operating margin of each company group in the respective region.
3) MEA stands for Middle East and Africa region.
Sources: S&P Capital IQ; Deloitte analysis.

midstream companies. While Asian gas distributors seemed highly cautious about the projected "high" gas demand growth in the region, the shipping industry seems to have struggled to align with changing trade patterns and geopolitical uncertainties (figure 3).

Gas distribution: Growing strong, yet failing on last-mile connectivity

Gas distribution companies, especially in Asia-Pacific (APAC), witnessed one of the best performance periods as low commodity prices, and growing supply of LNG from Australia and the US helped them capitalize on old infrastructure investments. Revenue and market capitalization for these companies reached an all-time high of US$86 billion and US$139 billion, respectively.[7]

However, from a sector that is expected to be the backbone of future LNG growth in the region, one might also expect a solid growth plan apart from good financial performance. Instead, investments to expand the APAC distribution infrastructure reached a 9-year low of US$6.3 billion in 2018.[8] What might be more concerning is that not only mature gas markets such as Japan and South Korea curtailed investments, all developing nations except China also underinvested during the past five years. The total spending level of developing countries was US$1.5–2.5 billion per annum less than their peak levels of US$7 billion in 2015.[9]

A possible explanation for this seems to be the demand uncertainty from the industrial sector due to volatility in oil-linked gas prices as well as the easy availability of cheap alternatives such as coal. Moreover, inconsistent state regulations, limited access to capital, and slow-paced evolution of commercial frameworks appear to degrade the investment case—distribution companies are still batting for a fixed annuity-based pricing model that can not only take away the volumetric risk but also allow them to raise cheap capital against that annuity.

With an intense focus on accelerating its gas economy, China implemented several pricing reforms to increase industrial demand—a 20 percent cut in nonresidential city gate price followed by the establishment of local trade hubs and exchanges.[10] Even after many thoughtful efforts, the country could only keep its gas distribution investments flat, which may not be enough considering its ambitious road map to expand LNG imports. It seems to imply that gas distribution investors remain cautious and may only buy the story of LNG growth once state policies and regional pricing become consistent and predictable.

Shipping: Sailing in troubled waters?

Shipping and transportation companies, particularly in Europe and Latin America, saw a modest gain in the top line but witnessed one of the roughest falls in their bottom line—the companies' operating margins fell by 20–25 percent in the past four years (figure 3).[11] Unlike other business segments where underinvestment was an issue, huge capital inflows and investment during 2013–2016 seem responsible for today's oversupplied situation in the shipping market—annual capex spends in the region during 2013–2016 was US$9 billion, as against an average of US$2–3 billion in the past.[12] The result: Since 2016, fleet utilization and freight rates (excluding for LNG) have collapsed by 80–90 percent.[13]

This buildup in capex, or demand estimation, was in anticipation of connecting new supply centers (including shales) with established demand centers. New supplies came, but they changed the state of the O&G industry to a buyer's market, added significant volatility to crude and natural gas price differentials between markets and grades, and altered established trade flows and shipping routes. The problems of overcapacity were possibly compounded by the potential of a trade war, US sanctions on Iran that reduced ton-mile demand due to fewer long voyages, construction of many cross-country pipelines (Sino-Myanmar, Sino-Russian, East-West Petroline, etc.), and tighter regulations on the emissions front.[14]

Although rising LNG trade is providing one source of growth to the sector, the performance of oil and product transportation is still key for generating predictable cash flows. It is likely that the opportunities in the liquids market might be limited in the future and could need timely actions to monetize. Some of those include potential increased product movement due to huge investments in the Middle East, International Maritime Organization (IMO) 2020 regulations, and aging very large crude carriers (VLCCs).[15] Also, it is time that O&G ecosystem should realize the importance of shipping for future growth and enable an environment where this sector could generate sustainable returns.

Lessons from the downturn

The global midstream industry seems to be in a phase of transition, whether in its growth and investment cycle, the mode and cost of raising capital, or variability and competition in the business. The issues and even the opportunities are often very region-specific in this sector and so will typically be the strategies to successfully navigate this environment. However, some broad considerations could help companies prioritize their focus areas:

- To minimize lag or lead in their infrastructure planning, US midstream companies may **adopt new commercial arrangements** that optimize risk–reward between operators and shippers. Contracts, for example, where midstream companies pay an upfront rebate in exchange for dedicated throughput, and even linking these rebates to some key upstream performance metrics (drilling or volumetric efficiencies).

- Shipping companies could start to differentiate themselves by delivering extra value to their clients by **leveraging digital solutions**. By running advanced autotuning algorithms on diverse data sets (spot prices, contractual obligations, port fees, weather data, etc.), shippers can not only help upstream players seize spot opportunities, but also turn idle asset time into opportunity, manage disrupted schedules due to end-market constraints, and understand the exact financial consequence of day-to-day business decisions.

- Gas producers and distributors along with local regulatory bodies can attain last-mile connectivity and overcome demand uncertainty issues by using **market-based pricing mechanisms** instead of multiple formula-based prices, becoming indispensable partners of governments in making their smart cities program a reality, and exploring **new contracting models** such as gas trading among bulk gas purchasers to even out seasonality in demand.

Midstream is both a driver and beneficiary of the tight oil boom and rising trade of natural gas worldwide. However, it is essential for midstream companies to stay ahead of evolving market dynamics so that infrastructure, time, and capital are allocated to where they are most needed and become a win-win for all stakeholders. Given supply and demand of fuels determine infrastructure needs, having a complete perspective across the O&G value chain is critical for midstream companies. Explore the entire *Decoding the O&G downturn* series to gain a 360-degree view on the industry.

Endnotes

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Refining & marketing: Eyeing new horizons

Anshu Mittal, Bala Vijayan Venkateshwaran, and Deepak Vasantlal Shah

AMONG THE VARIOUS players in the O&G value chain, petroleum refineries have been the biggest beneficiary of the lower-for-longer oil price environment—which has widened their crack spreads and renewed investors' interest in the business. In fact, the market capitalization share of pure-play refiners has nearly doubled to 12 percent in the overall industry's market capitalization over the past five years, breaking the

Although many industry pundits have provided piecemeal perspectives across the phases of the downturn and recovery, a consolidated analysis of the past five years and a complete perspective covering the entire O&G value chain could help stakeholders—from executive to investor—make informed decisions for the uncertain future.

With this in mind, Deloitte analyzed 843 listed O&G companies worldwide with a revenue of more than US$50 million across the four O&G segments (upstream, oilfield services, midstream, and refining & marketing) in an effort to gain both a deeper and broader understanding of the industry. The ensuing research yielded a six-part series, *Decoding the O&G downturn*, which sets out to provide a big-picture reflection of the downturn and share our perspectives for consideration on the future.

In **part five** of the series, we explore the downstream segment—assessing its fortunes during the oil price downturn, identifying possible reasons behind its strong performance, analyzing changes in the segment, and reflecting on the trends that will likely decipher the segment's oeuvre in the years ahead.

longstanding perception of it being a "disadvantaged" O&G business.

As always, a big change in a segment's outlook typically has many facets, both implicit and explicit, which have the potential to take industry watchers and even seasoned analysts by surprise. Did all pure-play refiners perform equally or was it a mixed bag? What fueled the interest of investors in a region—margins or growth prospects? How do the segment's stakeholders view the future? Having answers to these questions can be important to have an informed view about the future.

The dark horse comes through ...

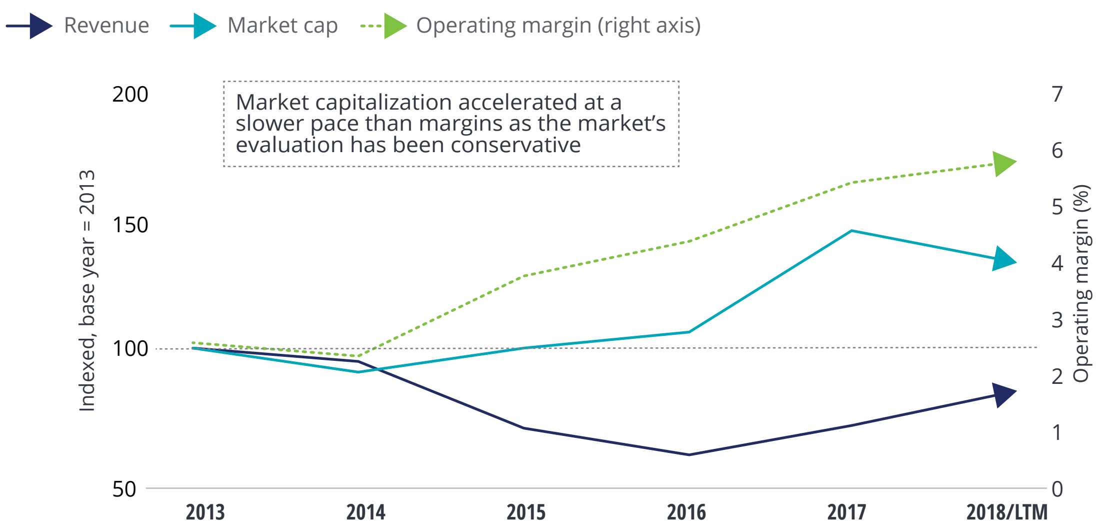
For the downstream segment, less has meant more. The fall in oil prices starting in 2014, a volatile 2015, and a 10-year low of US$26/bbl in 2016, followed by continued volatility in prices, have significantly benefitted the segment.[1] The downstream segment, which was considered noncore by many integrated players before 2011, became their savior in this downturn. In fact, operating margins of pure-play refiners and marketers grew three-fold to about 6 percent because of oversupply in the crude oil market, higher price differentials between crude grades, and higher-than-expected growth in petroleum products demand (figure 1).

The market, however, did not reward the segment's changed outlook in line with the gains it reported. Was it because of a flat dividend yield of 3 percent with less than US$7.5 billion in buybacks in 2018? No matter what the reason—uncertain prospects of growth in the long term, doubts about the sustainability of high margins if crude oil prices recover, concerns about impending International Maritime Organization (IMO) 2020 regulations,[2] or the looming large-scale capacity additions worldwide—investors have held their optimism about the sector in check.

Both margins and value creation are generally guided by actions and strategies of companies in the recent past, especially investment in upgrading the bottom of the barrel (refinery complexity). But has increasing complexity proved a panacea for cyclical maladies? Was the addition of upgrading complexity a successful business strategy over the past five years?

FIGURE 1

Downstream fortunes move upward in cadence with market trends



Note: This analysis covers listed companies in the downstream segment; it does not include IOCs and privately held refiners.
Sources: S&P Capital IQ; Deloitte analysis.

Complexity and profitability: Dissonance or resonance?

US light tight oil production growth and sustained price differentials between Brent and WTI and between light and heavy crudes, despite the end of the US oil export ban, have principally benefitted simple refiners. Over the past five years, in fact, operating margins of simple refiners (with a Nelson complexity factor of less than 9)[3] reached close to 7 percent in 2018, higher than what a complex refiner made in that year. Complex refiners have also recently come under pressure with cuts in supplies of heavy oil worldwide, leading to heavy crude trading at par or at a premium to light crude.[4]

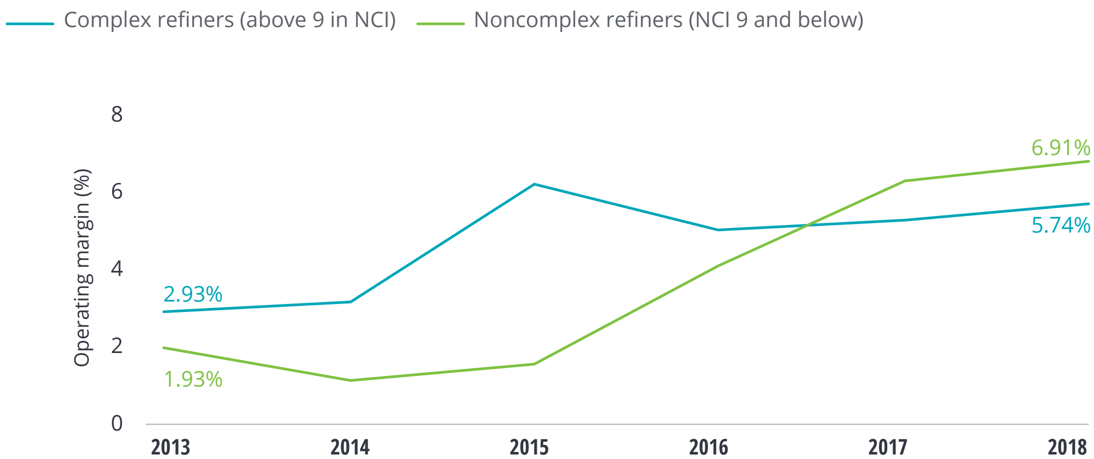
The industry, however, continues to put more dollars into complex refinery configurations, reflected in the 40 percent growth in the asset base of major complex refiners during 2013–2018. These investments probably reflect that companies aren't expecting a sustained discount in US light crudes (current Brent–WTI spread of about US$10/bbl), don't want to skew their product slate toward gasoline (which is already under both demand and pricing pressure), and would like to hold on to their feedstock and process flexibility (especially large refiners) (figure 2).[5]

These shifts and divergences have strong regional-level implications, including where new investment is going and where the most value

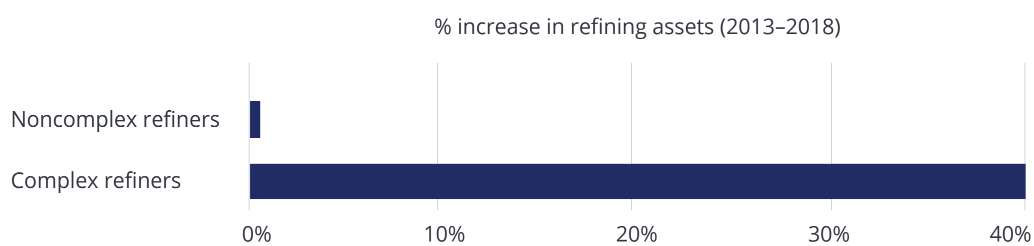
FIGURE 2

Globally, complex and noncomplex refiners have seen their operational results and investment priorities diverge (2013–2018)

Noncomplex refiners outperformed their counterparts as crude slates turned turtle



Refiners with complex configurations have expanded as they consider it essential for the emergent energy transition



Notes:
1. This analysis covers the top 50 listed companies in the segment owning refining assets, excluding IOCs, privately held refiners, and marketing companies.
2. NCI stands for Nelson Complexity Index.
Sources: S&P Capital IQ; Deloitte analysis.

creation is happening. How might the competition play out across regions in these new realities, especially when Middle East producers are acquiring refining assets in Asia to secure demand for their crude oil?

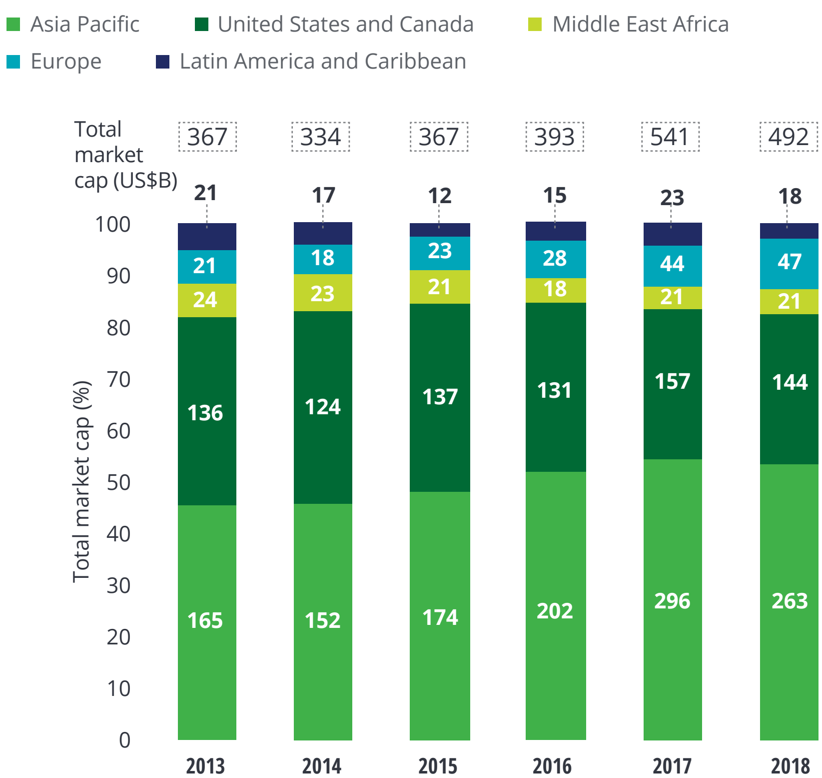
High margins in the west vs. growth in the east

On account of the light tight oil boom in the United States, margins of US refiners have traded US$6–10/bbl higher than Singapore refining margins. However, investors seem to have favored long-term growth in Asia over transitory high margins in the United States (which have come under increased pressure lately, and have been mixed at a product level as US gasoline refining margins fell to five-year lows in late 2018 while US distillate margins remained above the past five-year average).[6] The result: The market capitalization of Asian pure-play refiners grew by nearly 60 percent since 2013, as against only 5 percent for US pure-play refiners (figure 3).[7]

An option for export-oriented US refiners could be to look east to sell their rising gasoline production, but they will likely face intense competition from new capacity in Asia/Middle East as well as incumbent European capacity. Asia is projected to be the major contributor to global growth of coking units between 2018 and 2022, at around 38 percent of global planned and announced refinery coking unit capacity additions by 2022.[8] Upcoming capacity additions in Asia might also disrupt the plans of Middle East refiners and push them to look for other export markets such as Europe, especially for middle distillates. Although short-term demand pull for diesel due to the IMO 2020 ruling

FIGURE 3

APAC has grown to constitute the majority of global segment market capitalization



Note: This analysis covers listed companies in the downstream segment; it does not include IOCs and privately held refiners.
Sources: S&P Capital IQ; Deloitte analysis.

may provide some relief, more intense competitive pressure may ensue on less competitive refining assets in Europe and some parts of Asia.[9]

The impact of these changing market dynamics is not expected to be limited to fuels, competition between regions, and collaboration among traditional refining companies. Sophisticated large-scale plants incorporating crude oil-to-chemicals (COTC) technologies may change the basis of competition in petrochemicals because of their yield advantage. As against the global average of producing 8–10 percent naphtha from a barrel of oil from traditional refineries, these new plants can produce 40–45 percent petrochemical feedstocks. In short, the strategic focus of refiners may shift from advantaged feedstock to market access, capital efficiency, and technology utilization.[10]

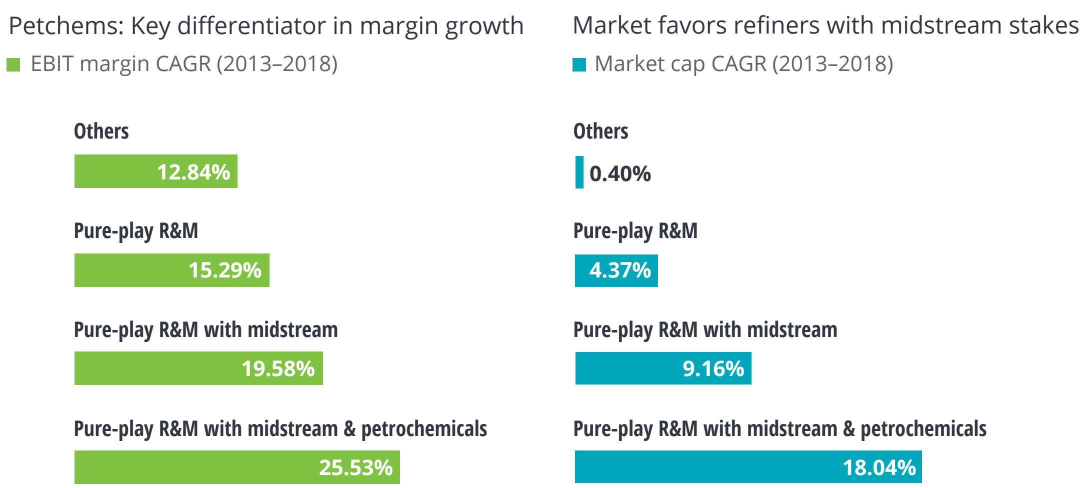
Rejigging the menu

While demand growth for crude oil sustains in the short-medium term, downstream players should focus on the composition of demand. With petrochemicals expected to represent about one-third of world oil demand growth between now and 2030, and nearly half by 2050, many refiners with forward-integration possibilities are looking to adjust their strategic plans.[11] According to the International Energy Agency, petrochemicals could add nearly 7 million bpd of oil demand by 2050, reaching a total of some 20 million bpd.[12] Apart from their regular usage in everyday products, petrochemical products are increasingly used to manufacture many parts of the modern energy system, including solar panels, wind turbines, batteries, thermal insulation, and electric vehicles, says the agency.[13]

Pure-play refiners (public and state-owned) are increasingly exploring value in investing in associated midstream and petrochemical infrastructure, where there is a natural advantage or necessity. Such companies have shown a stronger growth in margins than pure-play refiners, as evidenced by their ~26 percent CAGR margin growth during 2013–2018. But the recognition by the market of

FIGURE 4

Diversified refining players with petchem and midstream assets have shown the highest value expansion (2013–2018)



Note: This analysis covers listed companies in the downstream segment; it does not include IOCs and privately held refiners. Other companies include all those that do not have any refining assets, yet are active in other R&M areas.
Sources: S&P Capital IQ; Deloitte analysis.

their strong performance has been muted as the market waits to see if the returns can be sustained. The ROI may need to be analyzed for longer to ascertain its trajectory. This has been priced in by the markets (~10 percent CAGR in market capitalization, see figure 4).

On the other hand, surprisingly, pure-play refiners with only associated midstream business, especially in the United States, seem to have garnered more attention from investors—these companies registered close to 18 percent CAGR growth in their market capitalization. Pipeline constraints due to midstream bottlenecks (which has resulted in significant transportation costs) and notable divergence in crude grades and spreads across local markets in the United States have benefitted (or reduced costs for) refiners with midstream exposure.

Although trends vary by region, pure-play refiners with elements of midstream and petrochemical exposure seemed to have garnered more margins and delivered more shareholder returns as they have benefitted on all three fronts—advantaged crude, midstream bottlenecks, and strong petrochemical products demand.[14]

Lessons from the downturn

The refining and marketing segment has performed robustly over the past five years of a low-price environment. But challenges are already appearing on the horizon. These include ongoing price volatility in crude oil, slower growth in overall petroleum products demand in the long term, changing demand and crack-spreads at the product level, environmental and regulatory concerns such as those emanating from the IMO 2020 regulations, rising risk of overcapacity, and carbon footprint. Although the challenges for each company will likely be unique, the segment could benefit from the following considerations:

- As against having a product mindset, refiners could benefit from adopting a **molecular management** strategy (i.e., having a molecular-level understanding about refining streams and processes, and incorporating molecular modeling into the overall refinery optimization) to have more agility and adaptability in their operating model and stay ahead of changing demand patterns. Put simply, develop a complete capability from crude oil to end-uses through molecular characterization and modeling of refining streams.[15]

- Refiners should stay ahead of regulations especially on the emissions front through their **proactive investments** in sulfur-free, high-performance, clean-burning transportation fuels by upgrading the bottom of the barrel. Refiners should bring in plant-level goals and risk control mechanisms that can enable the team to understand its cumulative responsibility in achieving these goals.

- Refiners should look at innovative ways of enhancing netbacks on invested capital via **strategic, technological, and tactical alliances** that spread risk, maximize returns, sustain or grow their market share, and enable a win-win for all stakeholders (e.g., the 50:50 joint venture between Saudi Aramco and Total plans to invest around US$1 billion over the next six years in the Saudi retail fuel market).[16] New refining assets that are aiming to produce both refined products and petrochemicals should invest in the latest technical processes as well achieve economies of scale in terms of size and complexity.[17]

In conclusion, while the last five years may have been the “best of times” for the downstream industry, there is no guarantee that the next five years will see similar good fortune. Refiners will need to be agile and invest in both technologies and human resources in such a way that they can preserve optionality in product lines and pricing. Considering downstream is an integral part of the bigger O&G ecosystem, having a perspective across the O&G value chain could be critical. Explore the entire *Decoding the O&G downturn* series to gain a 360-degree view on the industry.

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Succeeding amid uncertainty: A preview of the years ahead

Duane Dickson, Andrew Slaughter, and Anshu Mittal

EVEN AFTER FIVE years into the oil downturn, energy pundits and company strategists are still figuring out how to emerge stronger and better in this uncertain business environment. The industry's long march to recovery has created an imbalance across the entire O&G ecosystem and performance gains continue to be discounted by investors. What are the challenges faced by all segments in the O&G value chain, where both strategy and execution have struggled? How can O&G companies overcome them and succeed in these uncertain times?

Although many industry pundits have provided piecemeal perspectives across the phases of the downturn and recovery, a consolidated analysis of the past five years and a complete perspective covering the entire O&G value chain could help stakeholders—from executive to investor—make informed decisions for the uncertain future.

With this in mind, Deloitte analyzed 843 listed O&G companies worldwide with a revenue of more than US$50 million across the four O&G segments (upstream, oilfield services, midstream, and refining & marketing) in an effort to gain both a deeper and broader understanding of the industry. The ensuing research yielded a six-part series, *Decoding the O&G downturn*, which sets out to provide a big-picture reflection of the downturn and share our perspectives for consideration on the future.

In this **final part** of the series, we provide a probable preview of the future and discuss how companies can transform in uncertain times.

The (challenging) context matters

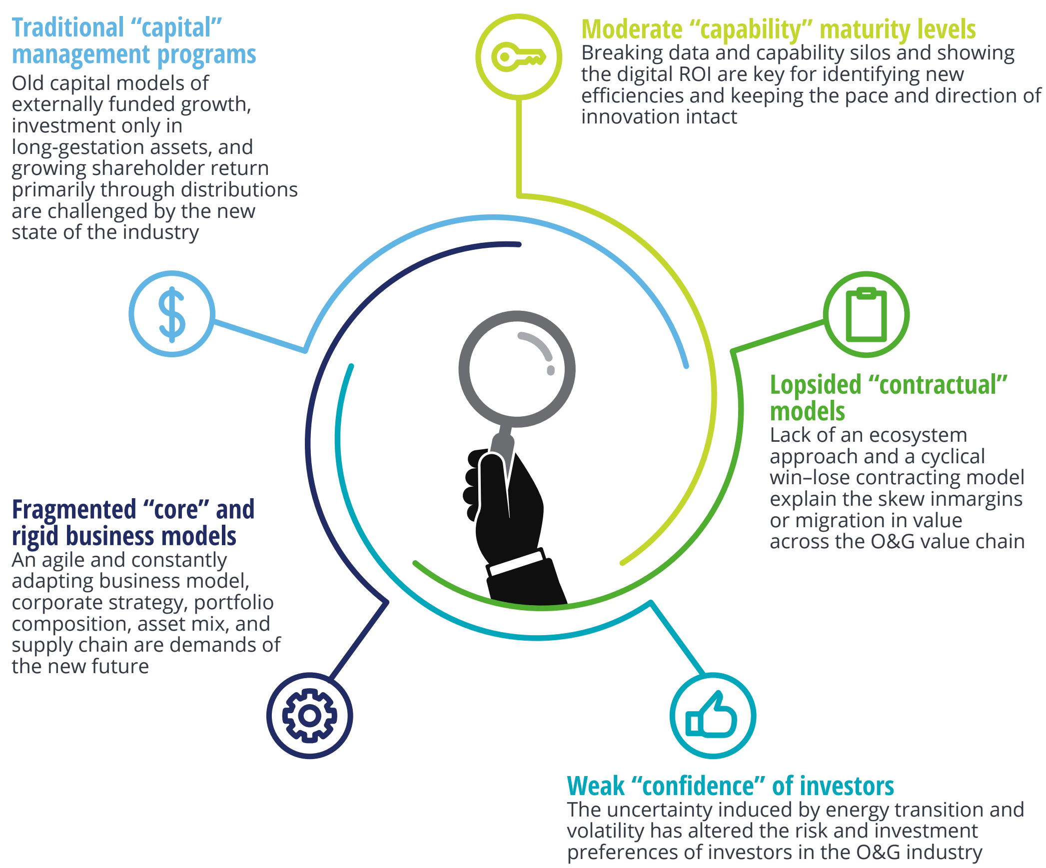
A detailed review of the past five years can provide a preview of the future. Our review of the past five years of the downturn has highlighted some of the industry's shortcomings; we call these the five Cs—core, capital, capability, contractual frameworks, and confidence (figure 1).

- **A fragmented "core" and rigid business models:** A less agile and inflexible business model, corporate strategy, portfolio composition, asset mix, and supply chain seem to be inhibiting the future of O&G companies. Whether it is the hidden inefficiencies in the portfolio of producers or the lack of a cohesive integration strategy of oilfield service majors, the O&G industry still has a long way to go in making its core future ready.

- **Traditional "capital" management programs:** Shale producers' outdated capital management strategies of growth at any cost, integrated oil companies' conservative investment agenda, midstream's externally funded growth, and downstream's cyclical overinvestments (the global refining sector is projected to add 2.6 MMbbl/d of new capacity in 2019, its largest annual increase since the 1970s[1]) are all creating imbalances in companies' books and limiting regular assessment of new priorities and opportunities.

FIGURE 1

The context matters



Source: Deloitte analysis.

- **Moderate "capability" maturity levels:** Although the overall numbers suggest that the industry hasn't completely taken its foot off the pedal of innovation and hiring, falling R&D spend of integrated oil companies (IOCs) and lower output per unit of labor of national oil companies (NOCs) appear to highlight the mismatch in the long-term strategies of the two biggest owners of O&G supply.

- **Lopsided "contractual" frameworks:** A cyclical win–lose contracting model between producers and oilfield service companies and producers and midstream companies can explain the skewed margins and lopsided relationship between segments during the downturn. Old contractual models should evolve and remain in sync with the changed profile of investment (from long-cycled to short-cycled), supply (under to over supply), and risks (from mainly sub-surface to increasingly above-ground) in the industry.

- **Weak investor "confidence":** Growing shareholder returns, primarily through dividends and share buybacks, haven't yielded expected results, leading to undervaluation over the past two years (in fact, the O&G industry is valued lower than the replacement cost of its assets). The uncertainty induced by this lower-for-longer and volatile price environment has altered the risk and investment preferences of many investors in O&G companies, where they are not only demanding higher hurdle rates but also expecting consistent performance across cycles.

Would a favorable future help O&G companies overcome these shortcomings? What does the future look like and how can companies across the O&G value chain prepare and transform?

The uncertain future

Although oil prices seem to have bottomed out as of early 2019, a slew of economic and industry data suggests a significant impact on oil and gas in 2019 and 2020, on both the supply and demand side, which could be either bullish or bearish for prices. Briefly put, volatility appears here to stay.

- **Robust economic growth, though downside risks are emerging:** After the global economy grew at a robust pace in 2017 and 2018, growth is expected to be moderate in 2019 and 2020 due to heightened political risks, rising trade tensions, and weakening currencies and slower growth in emerging economies.[2]

- **Involuntary cuts balance out, while OPEC-led compliance seems at risk:** Involuntary cuts in Venezuela and Angola have helped OPEC reduce oversupply in the oil markets, but the question about how long production restraint compliance can continue remains. Additionally, there are concerns that OPEC and its Vienna Agreement allies (led by Russia and Kazakhstan) could drift apart on the agreed cuts for 2019.[3]

- **Oil prices seem to have found a floor, but volatility has returned:** Although oil prices remain above US$50/bbl (WTI)—a physiological and economical threshold for US shales—volatility in prices increased in the last quarter of 2018. On a weekly basis, prices have swung by 8–10 percent over the past six months.[4]

- **OPEC's moderate spare oil capacity amid rising shale well inventory:** OPEC's spare oil capacity, heavily influenced by the organization's compliance, remains at a moderate level of 2.4 MMbbl/d, while the number of drilled but uncompleted shale wells in the United States crossed 8,500 in December 2018.

- **Disciplined investments raising underinvestment concerns:** Although moderation in capex has strengthened the balance sheets of O&G companies, decline rates of maturing conventional wells (both in the United States and globally) have risen significantly. Brazil's Campos Basin, for example, has registered a 30 percent fall in its production over the past five years.[5]

- **Financials of companies improving but new segmental shifts emerging:** O&G companies have never seemed as efficient as they are today due to their laudable work on the productivity and cost front. However, the migration of value and margins across the O&G value chain remains highly skewed, with vulnerabilities now emerging in downstream (especially on the gasoline front).

- **Permian and LNG driving growth, but infrastructure bottlenecks persist:** Infrastructure constraints are capping near-term production growth potential of both the Permian in the United States and large-scale LNG expansion worldwide.[6] Energy infrastructure, especially outside the United States, remains underinvested and monopolized, and faces several contracting issues.

Winning in uncertain times

Even after five years into the downturn, the industry remains in transition and the period of transformation continues for companies. How can companies overcome their challenges (the five Cs mentioned earlier), to set themselves up to succeed in uncertain times?

- **Strategically and tactically work on the "core":** Upstream companies have made headway divesting peripheral assets, but other segments remain focused on consolidation rather than optimization. For many companies, strengthening their core will likely require companies to right-size their portfolios, renew focus on operational excellence, centralize project delivery across the company, and transform their business models. Across the O&G sector, companies should assess where their sole competitive advantage lies, and where they are better off partnering with peers/vendors.

  More importantly, companies should emphasize flexibility, to prepare for both upside (from underinvestment) and downside (from macro concerns) risks. The right answer could vary by segment and by company. While many onshore US service companies should focus on increasing scale and scope as it will likely improve their performance, other companies such as shale-focused E&Ps may be better served by high-grading their acreage and only drilling the best wells.

  Clearly, mergers, acquisitions, and divestitures are expected to play a key role in streamlining portfolios, but tactical decisions could be as important as strategic ones. Removing excess layers and processes from the supply chain can cut costs, and in the case of a merger, economies of scale lend themselves to cost reduction and process integration. Similarly, as organizations grow (or shrink), the organization should flex as well, with key roles reimagined amid new corporate processes.

- **Embrace dynamic "capital" management programs:** The entire O&G sector seems to have struggled to balance revenue, capital expenditure (capex), and operating expenditure (opex). The importance of right-sizing portfolios is not just operational, but also financial. Companies should push to increase variability in costs to better align with variability in revenue. Flexible contracting can certainly help, as could lease-back agreements for high-cost equipment. However, the challenge remains that many large investments would have to be upfront (e.g., frac fleets, pipelines, refineries) in a cyclical business environment. Thus, diversification in some form has its own benefits.

  For some, diversity could mean investment in new energies such as solar, wind, and biofuels. For others, it could be the diversity of financing, augmenting public equity and debt issuance with private equity project co-investment, alternative structures (e.g., DrillCos), and cross-segment cost sharing. Sustainably balancing the books in a volatile business would require companies to assess all options, and combine various financial strategies to reduce costs, while increasing revenue to generate higher total returns.

- **Build new and differentiated "capabilities" with an eye on digital ROI:** Across the industry, R&D leaders should emphasize the ROI of investing in new capabilities—whether that is partnering with technology firms, expanding R&D investment, or reorganizing centers of excellence. This can also allow some segments/company groups to double-down on differentiation and connect their wealth of data and specialization with others in the ecosystem.

OFS companies, for example, specialize in working with many companies and they could position themselves as leaders in analytics and platforms that can be readily adapted to clients' rapidly changing needs. Midstream and downstream companies, on the other hand, have had a long history of using digital tools, but it might be imperative that they link their operations with the larger markets through advanced analytics, allowing them to be in sync with shifting regional supply and demand balances.

- **Adopt outcome- and performance-oriented "contracts":** Typical agreements between different segments share the risks and rewards to differing degrees, ranging from one-off turnkey contracts to long-term value-based payouts. During the downturn, it has been evident that service companies and, to a lesser extent, E&Ps have borne the brunt of the impact. Lower revenue, through either lower commodity prices or downward renegotiated pricing, combined with lower utilization, and remaining fixed costs, has hit the bottom line more severely than the top line. Midstream companies using take-or-pay contracts, as well as integrated downstream firms who were able to control margins, have fared better.

  In all cases, there is an argument for increased use of performance-oriented contracts, and increased risk-sharing. That provides incentives for improved performance, while reducing the impact of cyclical price downturns on one particular segment. However, there are limitations to consider. For example, debt financing in some circumstances may limit payout variability for gathering and pipeline operators. Moreover, companies pursuing high-risk, high-reward strategies may be averse to profit-sharing agreements. Nevertheless, a healthy oil and gas ecosystem requires healthy business segments, and the asymmetric impacts of the downturn seem to highlight the need for better contractual management of revenues, costs, and risks.

- **Regain investor's "confidence" through a compelling narrative:** A narrow, thinly executed transformation program of O&G companies based on a limited perspective on the future has undermined investor confidence in the O&G industry. Our analysis of several investor presentations suggests that today's investors aren't just following oil price cycles to time their investment, they also expect flexible short-term and compelling long-term strategies that are based on a wider set of disruptive possibilities.

  Meeting these expectations requires O&G companies to optimize their financial and strategy disclosures and give early and deeper thought to the probable pain areas highlighted by investors during investor presentations. Additionally, O&G companies, especially with a large and diversified portfolio, shouldn't shy away from talking about carbon emissions, sustainability, and even their view on renewables and investment in new energy (something that is proactively and consistently done by European supermajors, which have also outperformed other IOCs over the past five years). A detailed, transparent, and compelling view is what investors often need to build a long-lasting relationship with a company.

In the past, an eventual upswing in prices benefitted everyone, even those that had the highest breakevens and/or were the least efficient. But the new age of abundance, lower prices, and rising volatility could challenge the strategies and performance of even the best companies in the industry. Chasing the cycles or making piecemeal adjustments may not be winning options anymore. Explore the entire *Decoding the O&G downturn* series to gain a 360-degree view on the industry.

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Acknowledgments

A number of leaders and colleagues within Deloitte member firms generously contributed their time and insights to this report. In no particular order, the authors would like to thank **Rajeev Chopra** (partner, Deloitte Global), **Michael Lynn** (partner, Deloitte Australia), and **Roland Labuhn** (partner, Deloitte Canada) for their review and contributions to this research.

We would also like to extend our special thanks to **John England** (partner, Deloitte US) and **Scott Sanderson** (partner, Deloitte US) for their perspectives and suggestions on the entire series. Thanks also to **Rithu Thomas** (editor), **Sharene Williams** (chief of staff), **Jennifer McHugh** (OG&C sector specialist), **Joanna Lambeas** (marketer), **Dana Kruse** (marketer), **Mindy Porter** (marketer), and **Laurel McConn** (marketer) for providing valuable inputs, extensive marketing support, and critical editorial help at important junctures.

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