

Value Creation by Oilfield Service Companies

Oilfield Service and Supply Sector:

Value Creation 2005 - 2013

University of Houston, C.T. Bauer College of Business

Student Research Project

This report is developed solely for the purpose of class discussion. Cases and reports do not represent endorsements by the faculty or the C.T. Bauer College of Business on effective or ineffective management.

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1. Introduction

1.1 Research Objectives

This report documents the findings of a research project undertaken by students in the C.T. Bauer College of Business MBA program at the University of Houston.

The purpose of the project was to understand how Oilfield Service and Supply Companies have created value for their shareholders and other stakeholders in the past, and the strategic lessons that can be learned from their successes and failures.

The intent has been to create a vehicle that will integrate the capabilities within the C.T. Bauer School of top tier academic research with experience-based knowledge of the challenges facing energy companies. Through this integration and our long time frame looking back and forward ten years, we hope to provide a set of analyses and commentaries that will complement existing reports available from financial institutions and will be useful both to financial institutions and to the companies studied.

Prior reports have covered the Super-majors, National Oil Companies, Independent Producers and Independent Refiners. A forthcoming class will address the Midstream sector in the fall of 2014. We hope that these reports will deepen the relationship between the University of Houston and energy companies in Houston and beyond, creating opportunities for mutually beneficial dialogue.

We acknowledge the substantial assistance provided by Spears and Associates. John Spears provided the class with an excellent description of the OFS sector and the segmentation that his company uses to establish the size and market shares of each market segment. He also provided his company's database of market segments and market shares by segment, allowing the students to undertake analyses that would not have been possible without this proprietary data.

1.2 The Oilfield Service Sector (OFS)

The OFS sector has prospered over the past 40 years due to three important trends in the oil and gas industry:

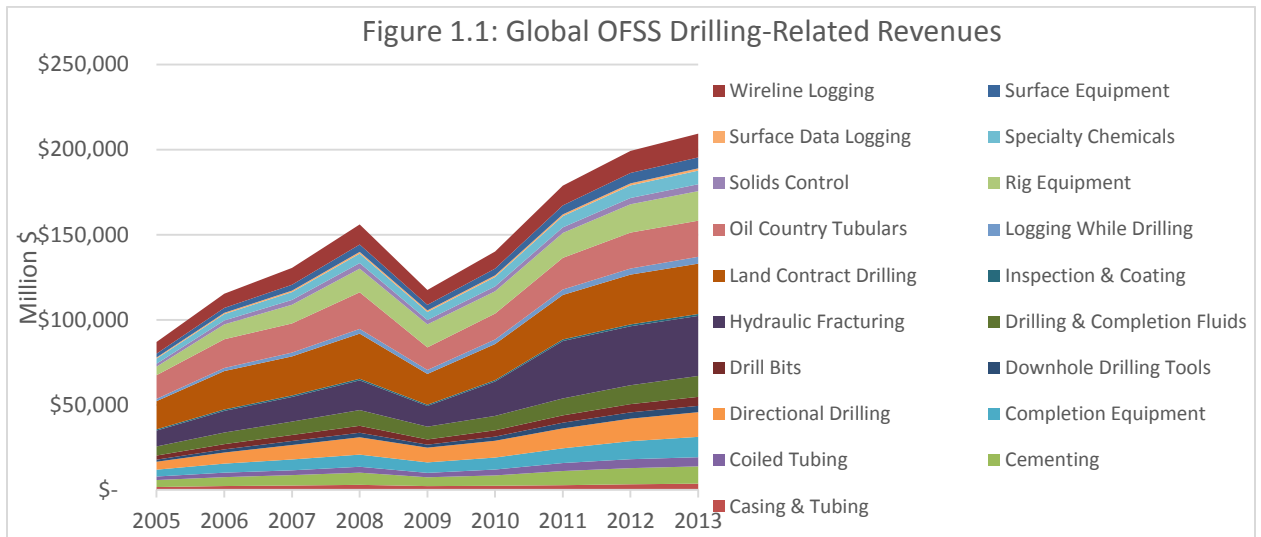
1. The rise of National Oil Companies after nationalization in the 1970s as a new set of OFS customers with responsibilities as stewards of national hydrocarbon resources but with limited internal technical and project execution capabilities.
2. A radical change in business models by the large oil and gas companies in response to low oil prices from the mid-1980s through the early 2000s, which led to substantial outsourcing to OFS companies of activities previously provided internally.
3. An increasingly challenging opportunity set for oil and gas companies as access to conventional resources shrank and oil prices rose, requiring new technology solutions, new products and expanded services from the OFS sector.

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These trends have resulted in substantial increases in OFS revenues by 11.3% p.a. from \$163 Billion in 2005 to \$386 Billion in 2013, according to Spears and Associates.

Onshore

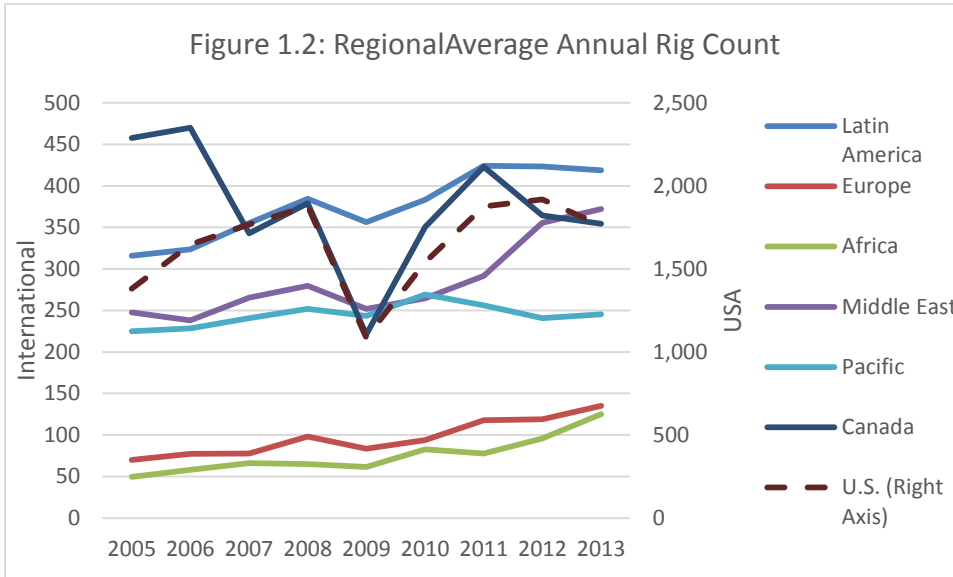
Within onshore drilling related segments, revenues grew even more strongly at 11.6% p.a. with particularly strong contributions from land contract drilling and hydraulic fracturing (Figure 1.1) as oil and gas companies aggressively developed oil and gas shale plays.



Source: Spears and Associates

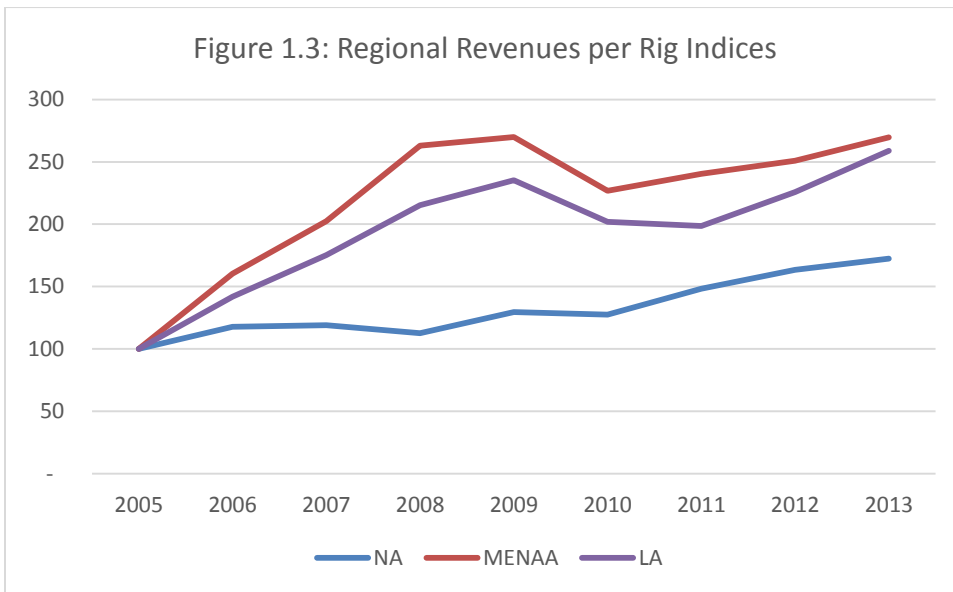
Driving these increased OFS revenues has been a rising rig count, as reported by Baker Hughes (Figure 1.2). However, note that the annual global rig count has grown at 2.8% p.a., substantially lower than OFS drilling related revenues. OFS drilling related revenues have increased at about four times the growth rate in drilling rigs due to the higher costs of more technologically advanced rigs, and the equipment and services required to find and develop more challenging resources along with some cost inflation.

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Source: Baker Hughes

Making some broad assumptions on the regional distribution of OFS services, an index of OFS revenues per rig can be developed (Figure 1.3), which suggests that the highest increases have been internationally in Latin America (LA) and the Middle East, North Africa and Asia (MENAA), perhaps due to less intense competition outside North America (NA).

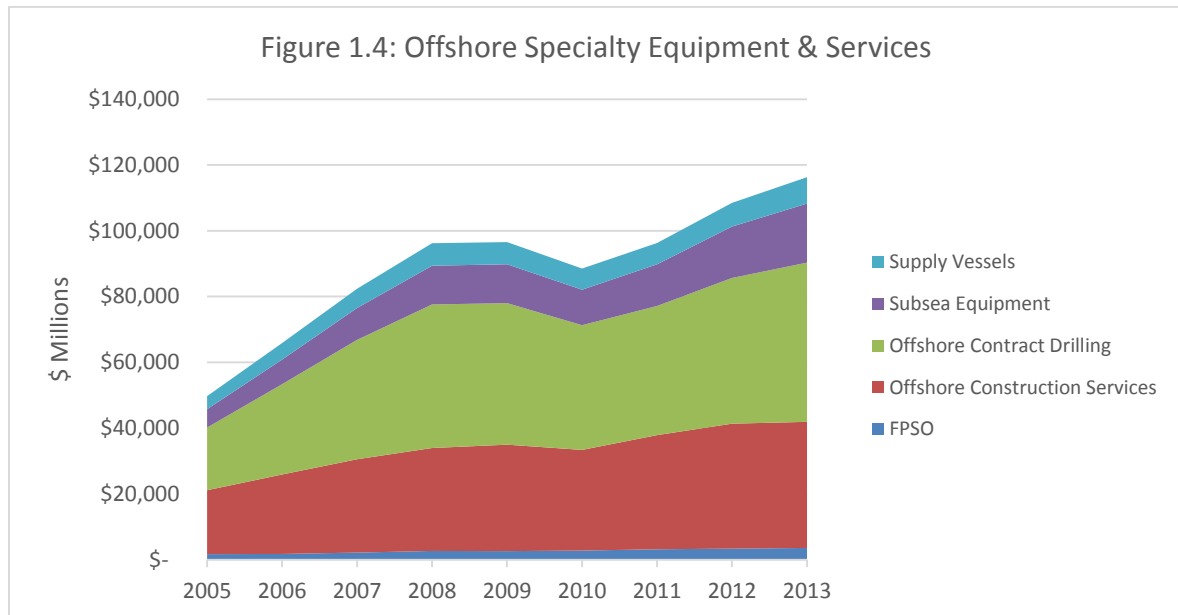


Source: GEMI Research

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Offshore

OFS revenues for offshore specialty equipment and services grew by “only” 10.8% p.a. from 2005-13, slowed by a hiatus in deep water Gulf of Mexico drilling (Figure 1.4) following the Macondo tragedy.



Source: Spears and Associates

Production related revenues are smaller and grew more slowly.

As a result of growth driven by the need for new services to tap resources in difficult formations (e.g., shales) and difficult locations (e.g., deep water), the OFS industry has grown into a major business sector with a few very large companies and many smaller ones providing a wide range of products and services. Our study covers 25 companies grouped into five sub-sectors (Table 1) each of which was addressed by a team of five MBA and BBA students.

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Table 1.1: OFS Companies Studied and their Sub-Sectors

Geophysical	Drilling	Majors	Offshore Specialists	Equipment Manufacturers
CGGVeritas	Transocean	Halliburton	McDermott	NOV
TGS-NOPEC	Nabors	Schlumberger	Subsea 7	Cameron
Petroleum Geo-Service	Helmerich & Payne	Baker Hughes	Saipem	FMC Technologies
ION Geophysical	Noble Corp	Weatherford	Tidewater	Schoeller-Bleckmann
Dawson Geophysical	EnSCO	China Oilfield Services Ltd ¹ .		Dril-Quest
				Oceaneering ²

The companies had market capitalizations at end 2013 varying from less than \$1 billion to more than \$100 billion (Table 1.1). This report focuses on which companies created most shareholder value and what are the strategic lessons from the differences between the winners and the less successful companies.

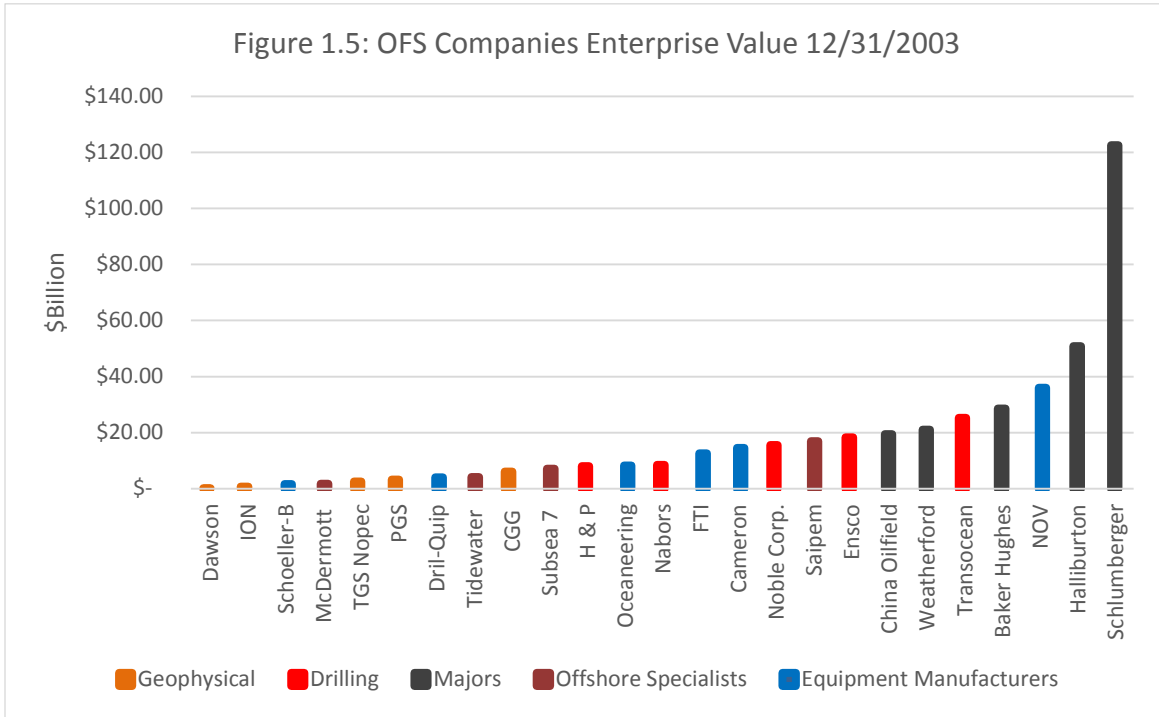
Again with thanks to Spears and Associates, we found that each company had a leading segment that was a primary contributor to earnings and cash flow as displayed in the boxed areas of Table 1.2. When that leading segment was large and growing fast, the company was able to create substantial shareholder value. The companies whose leading segment was smaller and growing more slowly faced head winds.

As in our previous studies, we start with the premise that shareholder value tracks the expected intrinsic value of the firm. Intrinsic value in turn is shaped by expectations of growth, returns on capital and risk. These are the result of strategic portfolio choices, execution capabilities and the leadership and organizational philosophy that define the firm's human system and which the companies have developed over many years.

¹ China Oilfield Services (COSL) was dropped from the sectoral analysis, since its growth has primarily been due to a single client CNOOC rather than success in a competitive market

² Oceaneering was moved from Offshore Specialists to Equipment Manufacturers Sub-sector , where it fits better

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Source: S&P Capital IQ

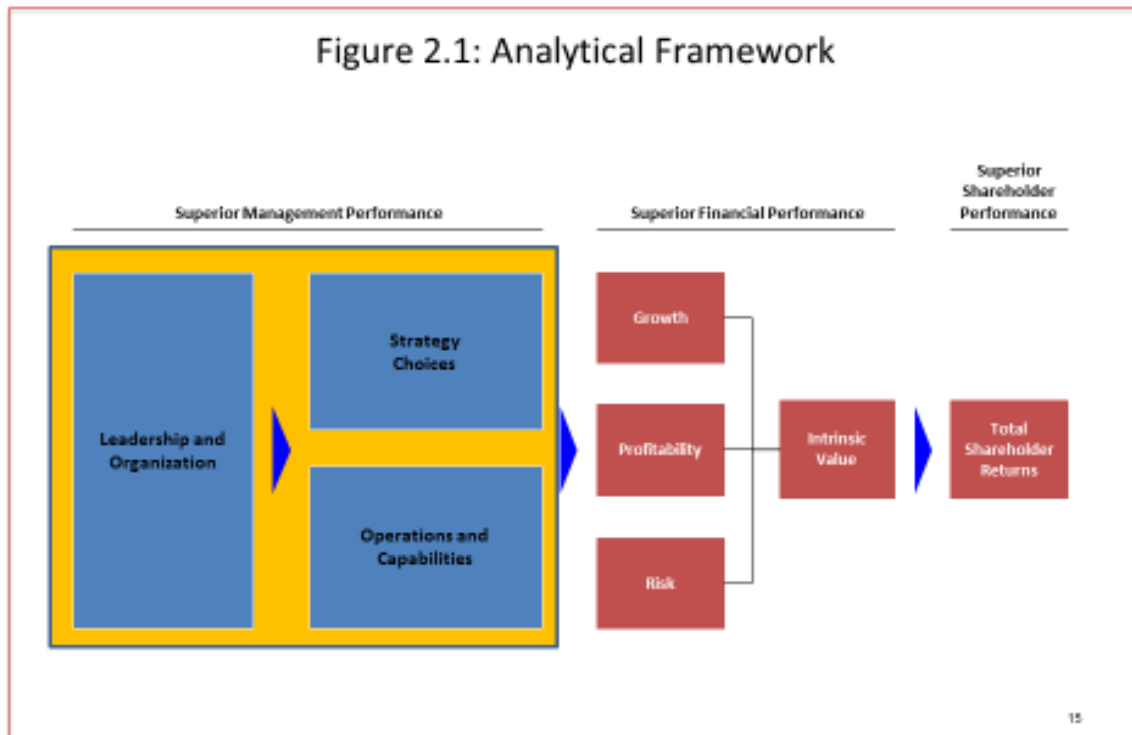
Table 1.2: 2013 Company Market Shares in Key OFS Segments

	12/13 EV	Geo-physical	Land Drilling	Offshore Drilling	Rig Equipment	Surface Equipment	Subsea Equipment	Downhole Tools	Offshore Construction	Supply Vessels	Hydraulic Fracturing	Directional Drilling	Casing & Tubing Svcs	Completion Equipment	Wireline Cementing	Logging
2013 Tot Revenues	\$17,078	\$29,565	\$48,420	\$17,365	\$17,948	\$17,948	\$3,708	\$38,345	\$8,030	\$35,281	\$14,507	\$3,725	\$11,968	\$10,151	\$13,983	
CGG	\$ 6.13	28%						5%								
PGS	\$ 3.30	9%														
TGS	\$ 2.52	5%														
ION	\$ 0.73	3%														
DWSN	\$ 0.19	2%														
RIG	\$ 25.32			19%												
ESV	\$ 18.28			10%												
NE	\$ 15.54			8%												
NBR	\$ 8.52		12%	1%	1%						3%	1%			1%	<1%
HP	\$ 8.00		11%	<1%												
NOV	\$ 36.00				52%	6%	2%	30%								
CAM	\$ 14.58				7%	29%	14%									
FTI	\$ 12.61					21%	25%									1%
OII	\$ 8.29						5%									
DRQ	\$ 4.04				1%	2%	3%									
SBO	\$ 1.71							18%								
SPM	\$ 16.91			3%						17%						
SUBC	\$ 7.10									17%						
TDW	\$ 4.22										17%					
MDR	\$ 1.80									8%						
SLB	\$ 122.57	26%						5%			20%	31%	2%	14%	27%	44%
HAL	\$ 50.90	4%				2%					26%	16%		28%	35%	16%
BHI	\$ 28.65										13%	18%	7%	26%	16%	12%
WFT	\$ 21.07		4%		1%	4%		7%			5%	9%	27%	9%	1%	6%
China OFS	\$ 19.46	3%		5%						7%		1%			2%	2%

2. Summary of Findings

2.1 Drivers of Shareholder Value

As for previous industry sectors, we focus our inquiry on the relationship between Total Shareholder Returns (TSR) and independent variables: growth (measured as annual revenue growth), profitability (EBITDA/ Total Assets) and risk (average beta). Our overall framework is described on Figure 2.1 shareholder value follows intrinsic value (NPV of estimated future cash flows discounted at the cost of capital); intrinsic value is a function of growth, returns and risk, which is shaped by strategic portfolio choices, effective operations and capabilities and an aligned leadership model.

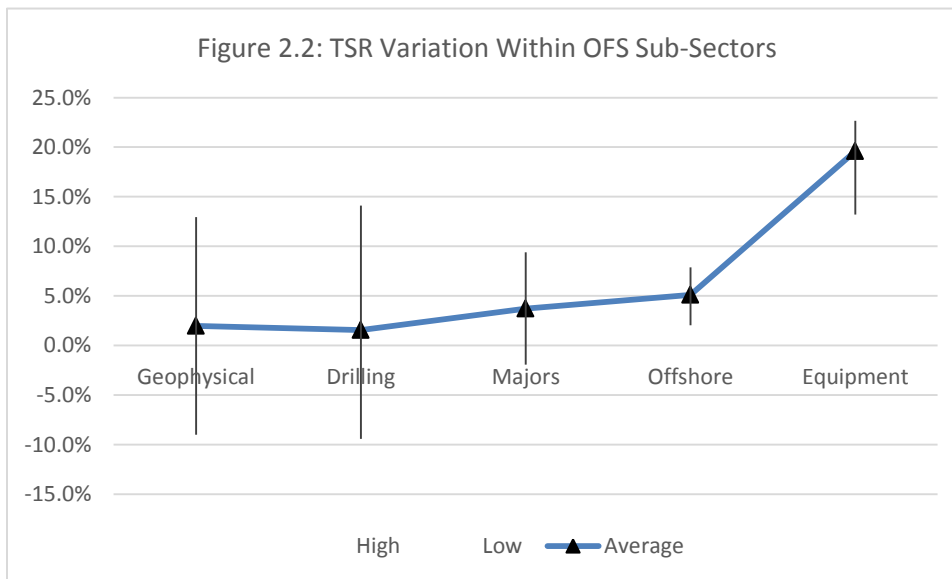


Our first finding is that the Sub-Sectors have produced very different Total Shareholder Returns (TSR) over the period 2008-13 (Table 2.1). We find that the Sub-Sector with the highest average TSR (19.6% CAGR) from 2008-13 has been specialized equipment manufacturing. Offshore Specialists (5.1% CAGR) also achieved returns slightly above the S&P 500 index (5.0% CAGR). The Majors (3.7% CAGR), Geophysical (1.0% CAGR) and Drilling (1.5% CAGR) Sub-Sectors trailed the S&P 500.

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	TSR CAGR	Revenue CAGR	EBITDA/ Total Assets	Risk (Beta)
Geophysical	2.0%	8.8%	24.2%	1.965
Drilling	1.6%	15.9%	16.8%	1.270
Majors	3.7%	15.5%	19.2%	1.484
Offshore	5.1%	10.9%	11.4%	1.555
Equipment	19.6%	15.5%	17.3%	1.416
S&P 500	5.0%			

On the face of it, Drilling, Majors and Equipment Sub-Sectors on average have similar revenue growth and EBITDA/ Total Assets performance metrics, yet achieved very different shareholder returns. One reason is the presence in the three Sub-Sectors with lowest TSR of companies in distress (e.g., ION in Geophysical, Nabors in Drilling, and Weatherford in Majors). However, these Sub-Sectors also hold companies with high TSR (e.g., Helmerich & Payne in Drilling and TGS Nopec in Geophysical). The wide variation in Sub-Sector TSR (Figure 2.2) is indicative of changes within the Sub-Sector, which have caused companies to make strategic choices: some have been more successful than others. The variation also provides information that can help us understand the contribution of the drivers (growth, returns and risk) to TSR in each Sub-Sector and to identify winning strategies.



Source: S&P Capital IQ and GEMI Analysis

Detailed analysis of the Sub-Sectors is provided in Section 3 of this report. The important lesson is that there is a wide variation in the performance of companies across and within the different

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sub-sectors, depending on the specific segments in which they compete and the business model they deploy.

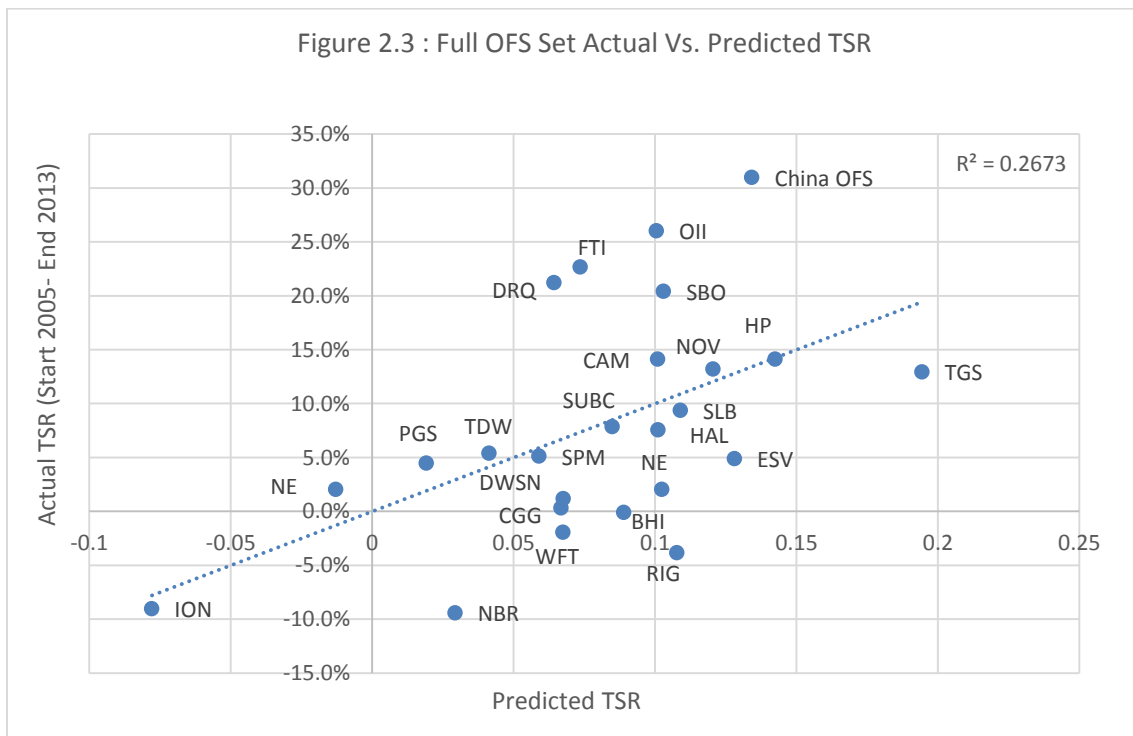
- Within the **Geophysical** Sub-Sector, TGS Nopec (12.9 % p.a. CAGR) was by far the leader in creating shareholder value. None of the other geophysical companies produced TSR above the S&P 500 index. What distinguishes TGS Nopec is that the company does not manufacture or own the equipment used to acquire geophysical data. Instead it leases the equipment required to complete its surveys, thus generating higher EBITDA/ Total Assets Returns, and lowering its risk during market downturns. At the other extreme, ION (negative 9.0% p.a. TSR) was primarily a manufacturer in 2005 and has been trying to transform itself into a processor of geophysical data since then but has not yet demonstrated that it can be successful.
- Helmerich and Payne (14.1 % p.a. TSR) has been the highest performing **Drilling** company by recognizing early the emerging demand for powerful rigs incorporating technologies capable of safely drilling deep horizontal wells with extraordinary precision. By focusing on this segment, it achieved superior revenue growth and EBITDA/ Total Assets returns. At the other extreme, Nabors (negative 9.4% p.a. TSR) did not focus on this opportunity and maintained an incoherent portfolio with a large fleet of conventional land rigs, a fleet of largely shallow water offshore rigs and other small businesses in rig equipment, hydraulic fracturing, directional drilling and cementing (see Table 1.2). Nabors has a weak Board that has failed to provide the necessary governance to refocus the company. In the offshore drilling segment, Ensco (4.5% p.a. TSR) led, but trailed the S&P 500, despite being the beneficiary of Transocean's (negative 3.8% p.a. TSR) travails following the Macondo tragedy. Interestingly, Noble Corporation is splitting its shallow water fleet into a separate company to focus solely on deep water drilling.
- Within the **Majors**, Schlumberger (9.4% p.a. TSR), closely followed by Halliburton (7.6% p.a. TSR) beat the S&P 500, while Baker Hughes (negative 0.1% p.a. TSR) and Weatherford (negative 1.9% p.a. TSR) struggled. The two TSR leaders enjoy consistently high market shares in the segments where they compete (Table 1.2) and are able to provide integrated services to National Oil Companies to operate mature oil fields. Their strength and breadth together with commendable capital discipline allows them to generate superior EBITDA/ Total Assets returns. Weatherford has grown revenues fastest by serial acquisitions, but this strategy has resulted in an incoherent portfolio of weak positions in multiple segments, financial stress, high beta and the need for drastic rationalization.
- The leading **Offshore** construction company Subsea 7 (7.9% p.a. TSR) grew revenues through its merger between Acergy and Subsea 7. This is a highly capital intensive Sub-Sector that requires continuous investment in new vessels to enable construction and installation of ever heavier and more complex deep water platforms and meeting growing demand for subsea production and pipeline systems. EBITDA/ Total Assets returns are lowest of the Sub-Sectors studied (Table 2.1). McDermott (2.0% TSR), the originator of the offshore construction Sub-Sector, has delivered erratic results in recent years and

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recognizes that it has fallen behind in subsea installation, while Subsea 7's name signals its focus on this segment.

- All the companies studied in the specialized **Equipment** Sub-Sector produced TSR above the S&P 500. Oceaneering (26.0% p.a. TSR) led the Sub-Sector due to its dominant position in remote operated underwater vehicles (ROV), followed by FMC Technologies (22.7% p.a. TSR) with its strong focus on subsea completion and well-head equipment. Drill-Quip (21.2% p.a. TSR) is a smaller company that has been chipping away at FMC's strong market position. Schoeller-Bleckmann (20.4% p.a.) is an Austrian company with a unique strength in manufacturing non-magnetic steel for downhole tools. Cameron (14.1% p.a. TSR) and National Oilwell Varco (13.2% p.a. TSR) have provided shareholder returns well above the S&P 500 and have grown revenues through serial acquisitions. This strategy has delivered lower TSR than the other companies with an intense focus on designing and manufacturing distinctive products that enable development over challenging resources.

The study groups investigated a wide range of financial metrics (Appendix A), looking for drivers of TSR and settled on the dependence within each Sub-Sector of TSR on the drivers of revenue growth, EBITDA Returns and risk (beta; see Appendix B). Multiple regression of TSR performance for the full set of twenty five companies from the start of 2005 to the end of 2013 as the independent variable and revenue growth, EBITDA/Total Assets returns and risk (beta) as the independent variables only explains a portion of TSR Differences among the full set of OFS companies (Figure 2.3). Therefore, the Teams focused on studying the relation between TSR and the drivers in each of the Sub-Sectors.



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Source: S&P Capital IQ and GEMI Research

The findings on the drivers of shareholder value indicated important differences between the shareholder value drivers of the different segments that appeared intuitively reasonable and suggest the need for different strategies for each segment as will be described later. The Team studies reinforced the finding above that some segments produced markedly different TSR results than others, reaffirming the importance of making good portfolio choices.

As expected, TSR in each sector was dependent on growth, returns on assets and risk. However, the strength of the dependence and its sign on these three variables differed across the Sub-Sectors (Table 2.2).

Dependent Variable=>	Revenue Growth	EBITDA/ Total Assets	Risk (Beta)
Sub-Sector			
Geophysical	61%	83%	-93%
Drilling	81%	69%	-35%
Majors	65%	88%	-63%
Offshore	86%	68%	-13%
Equipment	-72%	81%	12%

The inferences are that EBITDA/ Total assets drive TSR for all the Sub-Sectors³; that revenue growth is also important for Drilling, Offshore (positive driver) and Equipment (negative driver); and that risk matters for the Seismic Sub-Sector.

We discuss in Section 2.5 the strategic implications of the findings on value drivers as well as the required capabilities and leadership models, incorporating also the insights from analysis in Section 3 of the differences between the TSR leaders and the less successful companies in each Sub-Sector.

2.2 OFS Company Valuation

2.2.1 Intrinsic Value

Simple financial models were built for each company. Intrinsic value was calculated as the net present value at January 1, 2014 of projected future 2014-25 cash flows discounted at the WACC for each company with the following assumptions:

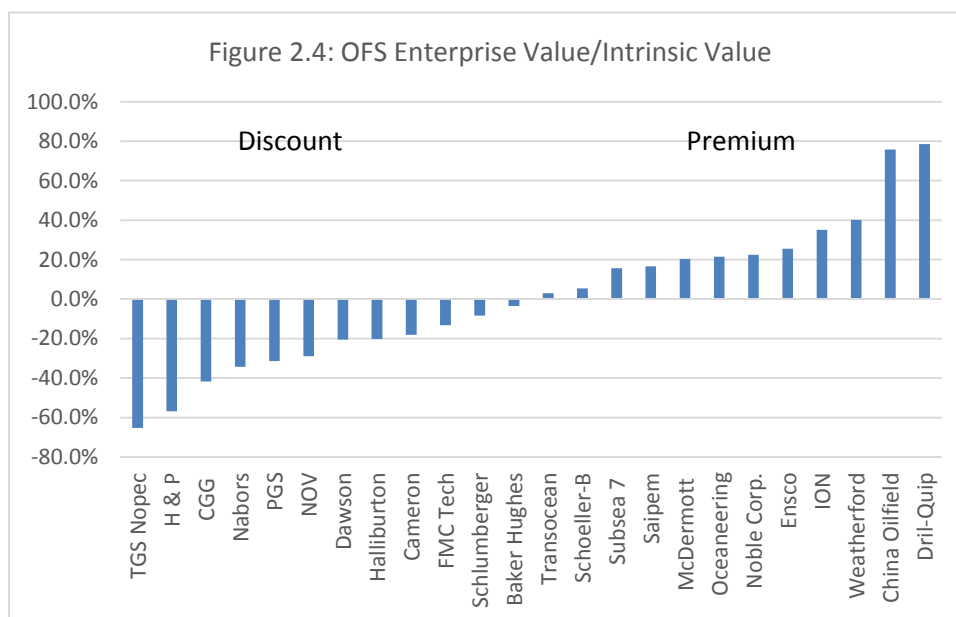
- Cash flows from 2005-13 were related by regression analysis to Spears estimates of total market revenues for the leading segment of each company

³ In this report, Sector refers to the entire OFS industrial sector; Sub-Sector refers to the five OFS industry Sub-Sectors whose members are shown on Table 1.1; Segment refers to industry segments defined by Spears and Associates, of which those important to this studies are shown as the columns of Table 1.2.

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- Future total market segment growth was assumed to continue at 2005-13 rates and the 2005-13 regression equation was assumed to remain valid for 2014-2025. 2025 net cash flow was continued at the 2025 level for a further 10 years to represent a residual value. Some exceptions were made:
 - The Offshore Drilling regression equation omitted 2008 and 2009, years of rig scarcity and exceptionally high day rates
 - McDermott (2006-08 & 2013) and Weatherford (2007-08) presented erratic financial results that were adjusted to provide a normalized equation
 - A lower 2012-13 growth rate was used for the geophysical segment, which appears to have fallen back from the high growth rates of 2010-13, suggesting a slowdown in exploration expenditures

Notwithstanding the expected strong correlation between calculated Intrinsic Value and market based Enterprise Value, the simple financial models suggest that some companies are valued in the market at a premium over calculated Intrinsic Value and some at a discount (Figure 2.4).



Source: S&P Capital IQ and GEMI Research

This raises questions that will be discussed later in this section:

- Are the generic assumptions used for the full set of companies appropriate given each company's business portfolio, recent performance and future plans?
- What the changes in assumptions are required to close the gap between Enterprise Value and Intrinsic Value for each company and are there good reasons to make those changes?
- Are the expectations embedded in the companies' Enterprise Values realistic?
- What are the strategic implications for the individual companies?

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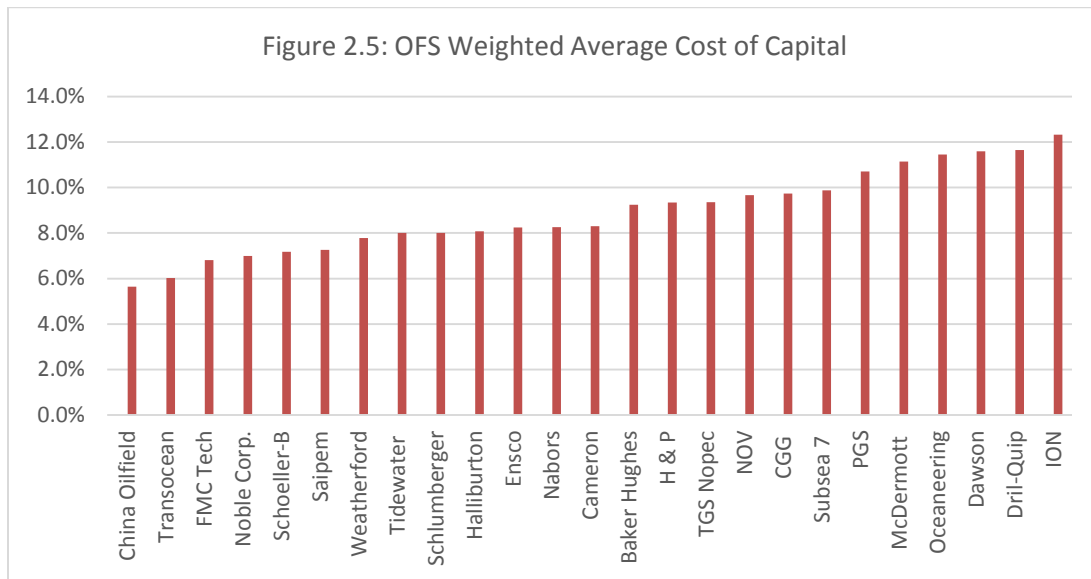
2.2.2 Cash Flows

Cash flow from operations from 2005-13 was calculated as earnings before taxes excluding unusual items, less pro-forma taxes at 35%, plus depreciation and amortization. Calculated cash flow from operations was related to Spears’ estimate of total market revenue for each company’s leading segment. The resulting correlation reflected each company’s ability to extract cash flow from the overall revenues of the segment, including improvements or deterioration in market share and relative financial efficiency. By applying the regression equation to the future, the implicit assumption is that any such systemic changes would continue.

Capital expenditures were assumed to continue into the future at the same proportion of cash flow from operations as during 2005-13.

2.2.3 Cost of Capital

Weighted average cost of capital was calculated for each company assuming a 3.5% risk free rate of return, a 5% overall market premium which was multiplied by the calculated beta for 2005-13 and the actual average interest on existing debt adjusted for tax (Figure 2.5).



Source S&P Capital IQ and GEMI Research

2.3 Governance

The teams reviewed the composition of the Boards of Directors in each of the companies studied. They investigated the hypothesis that in this industry, it is important to have Board members who have had experience at senior levels in the OFS or upstream oil and gas industries in order to be able to challenge effectively the CEO and executives on: the proposed strategic direction; the sufficiency of the quantity and quality of capabilities in the company’s workforce to implement the strategy; and the overarching leadership and organizational framework of the company, including clarity of strategic

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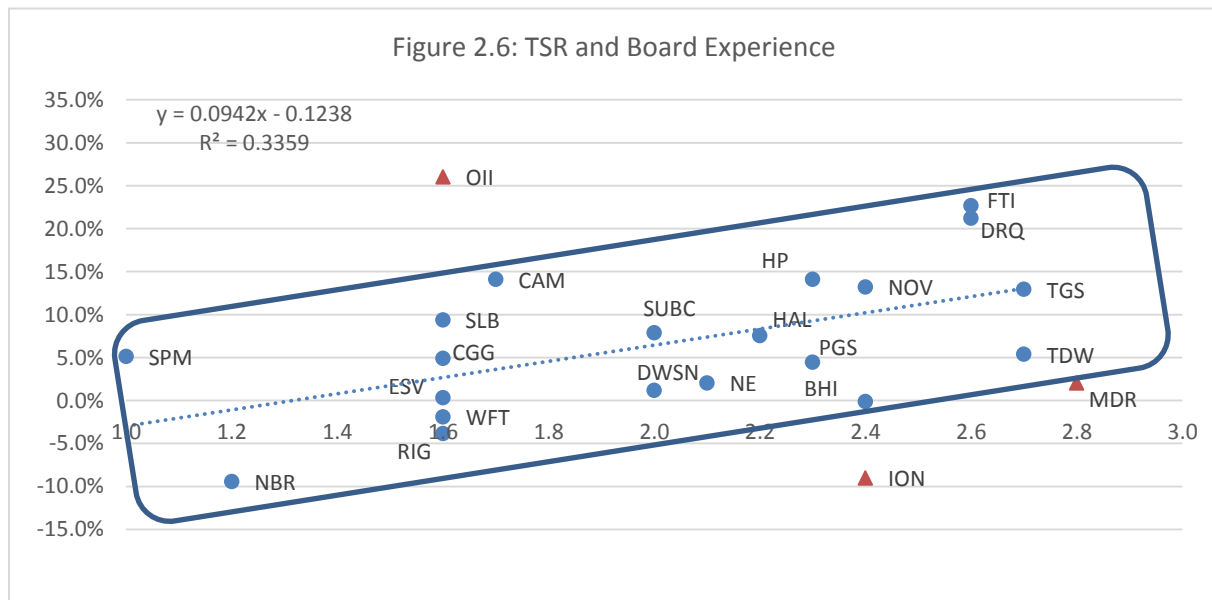
communications, values and culture, performance management, decision rules and talent development.

To do this we ranked Board members according to the scoring system below (Table 2.3)

Table 2.3: Board Member Scoring System

	Member	Background	OFS Industry or Upstream Oil	Related Industry Segment	Banking, Finance, Other Industry	Other
Weight			3	2	1	0

We concluded that there was some validity in this hypothesis (Figure 2.6), though Board quality can only be expected to explain some of the variation in TSR: most of the variation will be caused by the



quality of executive management and its commitment to delivering value for shareholders.

Source: GEMI Research

To reach this conclusion, we excluded three outlier companies:

- Oceanering seems to have had such strong tailwinds from the growing need for Remote Operating Vehicles for offshore drilling and development projects and its position as the first mover in this field that the weak Board has not (yet) mattered.

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- ION and McDermott are in the midst of major turnarounds following recent CEO changes, the results of which are uncertain. In principle, their strong Boards should be able to abet improvement in future performance.

Nevertheless, companies with Board scores less than 2.0/3.0 should consider strengthening their Boards by adding more relevant industry experience.

2.4 Conclusions from Intrinsic Value Analysis

We were able to explain most of the differences between 12/31/2013 enterprise value and intrinsic value calculated by our standard model by acknowledging that investors may be predicting future revenue growth rates that will be different from those of the past that were assumed to continue in the first runs of our standard model. Table 2.4 summarizes the changes we made. The full set of Enterprise and Intrinsic values with Standard Model and Adjusted Growth rates is provided as Appendix B.

Table 2.4: Revenue Annual Growth Rates – Standard Model and Adjusted

	Standard	Adjusted	Rationale
Geophysical -Offshore	6.6%	1.0%	Major new offshore plays largely surveyed
Geophysical -Land	6.6%	5.0%	Overall slow-down but new opportunities in micro-seismic
Offshore Drilling	8.5%	11.0%	Recovery from Macondo slow-down
Land Drilling	11.6%	3.0%	Improved efficiency and independent O&G cash constraints
Supply Vessels	7.7%	11.0%	Recovery from Macondo slow-down
Offshore Construction	7.8%	9.5%	Recovery from Macondo slow-down
Hydro Fracking	20.4%	18.0%	Independent oil & gas company cash constraints
Rig Equipment	9.8%	5.9%	Consistent with slowing land drilling
Surface Equipment	17.2%	14.5%	Consistent with slowing land drilling
Downhole Tools	15.1%	12.8%	Consistent with slowing land drilling
Subsea Equipment	18.5%	18.5%	No change

By adjusting the revenue growth rates as shown above, we were left with nine companies out of the 25 studied which had a greater than 10% discrepancy between enterprise value and intrinsic value (Table 2.5). Most of the discrepancies err on the side of optimism, which may not be justified.

Table 2.5: Companies with >10% EV/IV Discrepancy after Modifying Revenue Growth Rates

	Lead Segment	EV/IV	Possible Explanation
TGS Nopec	Geophysical	(51.3%)	Surprising lack of faith in the TGS asset-light model
ION	Geophysical	52.0%	High expectations from the new leadership's turnaround
Nabors	Land Drilling	22.8%	High expectations from the new leadership's turnaround
Tidewater	Supply Vessels	39.3%	High expectations from modernization of fleet
Baker Hughes	Hydro Fracking	15.1%	Value improvement from lower capital and R&D spending
Weatherford	Hydro Fracking	65.1%	High expectations from portfolio rationalization
Dril-Quip	Subsea Equipment	78.6%	High expectations for penetration of leaders' market niches
FMC Technology	Subsea Equipment	(13.3%)	Segment leader vulnerable to competition; no compelling product extension opportunity
Oceaneering	Subsea Equipment	21.5%	High expectations that ROV niche growth will accelerate

Of these companies, ION, Nabors and Weatherford have turnarounds under way including substantial changes in their portfolio composition and investors appear optimistic of an outcome that will substantially increase cash flow. Such transformations are difficult and not always successful. By contrast, investors are pessimistic on TGS Nopec's ability to sustain its stellar financial performance and the company appears undervalued relative to its peers CGG and PGS, which are weighed down by high capital employed in owned and manufactured seismic acquisition equipment.

Baker Hughes has been spending proportionately more than its peers on R&D and capital projects; these projects have to pay off or be pruned to support the EV; Tidewater has been investing heavily in renewing its fleet and its valuation assumes that it will be able to capture higher day rates from oil and gas companies highly focused on capital discipline. Investors may be overly optimistic.

Dril-Quip has had considerable success picking offshore niches where it can be successful and perhaps are reaching a critical mass that can justify its high valuation; Oceaneering is the leader in subsea Remote Operated Vessels which are in strong demand for deep water developments and may also justify its high valuation. Investors seem to be betting that both smaller rivals can take subsea market share from FMC Technologies

2.5 Overall Conclusions

The Oilfield Services Sector produced a mixed bag of shareholder returns from 2005-2013: 14 of the 25 companies studied delivered TSR higher than the 5.0% pa recorded by the S&P 500 index (SPX), so slightly more than half the companies outperformed the SPX. There was a wide range of TSR performance both across and within sub-sectors.

The five sub-sectors studied fall into three categories with distinctively different value drivers, leading to different natural strategies, required capabilities and corporate leadership and organization attributes. One size definitely does not fit all in this complex OFS Sector.

Investors value companies in the **Drilling** and **Offshore** Construction Sub-Sectors that deliver Growth **and** Returns: Driller TSR is more closely correlated to Growth and Offshore Construction TSR is more closely correlated to EBITDA/ Total Assets Returns. Both these segments construct complex, capital intensive assets and then operate them on behalf of their oil and gas company customers on terms that are negotiated with upstream operators and generally provide only modest returns.

- Natural strategies are to concentrate on a single **drilling** segment (e.g., Helmerich and Payne on land-based horizontal drilling) or set of **offshore** construction challenges (e.g., Subsea 7 emphasis on subsea construction) with strong growth potential at which the company can excel, and eliminate activities not related to the chosen focus area(s). Acquisitions or mergers can be useful to boost growth so long as they lead to synergies that further strengthen returns on capital.
- Capabilities required include project management in supervising rig and offshore service vessel design and construction so that they will be delivered on time on budget; close

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relationships to become a trusted strategic partner with important, growing upstream operators and achieve high rig or vessel utilization factors; and operations excellence to assure safe and low cost operations.

- The desired leadership model should include a culture that values safety as paramount (e.g., awareness of the human and financial costs of the Macondo tragedy); decision rules developed collaboratively with the upstream operator and partners; performance metrics that reward speed and low cost but not at the expense of safety; and highly trained personnel who command the respect of their clients.

A provocative conclusion from analysis of the Equipment Sub-Sector is that investors value returns positively but **penalize** higher growth deriving from sequential acquisitions. It appears that the better success model for this segment is to create distinctive products designed to solve the complex technical problems of developing difficult resources in difficult locations, enabling premium pricing and modest growth.

- Natural strategies are to emphasize technological innovation, uncovering advances outside the OFS Sector to incorporate in new distinctive products (e.g., Oceaneering's dominant position in ROVs based on initial military contracts) and to partner with upstream operator clients to create custom solutions to the technical challenges they face (e.g., FMC Technologies work on deep water subsea well-heads). Incremental expansion of product lines seem more likely to add shareholder value than acquisitions.
- Critical capabilities include highly skilled teams with a reputation for technological innovation, capable of working well with upstream industry clients; custom fabrication of specialty products at reasonable cost, with an eye on the potential for standardization (although this could put pressure on margins).
- The leadership model should reinforce a culture that values technical innovation that can be translated into distinctive products; decision rules that provide space for technical personnel to experiment; performance metrics that encourage innovation; and the attracting and developing new talent that can complement existing teams.

Finally, we found that the Seismic and Majors Sub-Sectors were most sensitive to Returns **and** Risk (Beta), implying that investors are looking for conservative financing and predictable, profitable operational and financial results from these sectors.

- Natural strategies should aim to create a strong competitor in every segment where the company competes with an "up-or-out" philosophy for underperforming segments (e.g., Halliburton's strength in hydraulic fracturing), by offering leading technology solutions coupled with customer relations based on trust. Acquisitions should only be considered if they further strengthen existing segments or open up a new segment in which the company can be a profitable leader (e.g., Schlumberger's continuous acquisitions of small technology companies to strengthen its lines of business). Financial strategies should be conservative to preserve a low beta. As will be discussed later, there may be a case for unbundling the products that are designed and manufactured in these companies from the services that

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utilize those products (e.g., it is questionable whether its subsidiary Sercel's manufacture of Vibro-seis trucks adds value to CGG).

- Critical capabilities should support “no surprises” in which the company regularly exceeds performance expectations and include capital discipline (e.g., Weatherford overspending contributed to low shareholder returns), well designed budgeting controls, as well as operations excellence. Technology investments should be designed to reinforce the company's leading position in its segments.
- The leadership model should reinforce a “no surprises” culture that values over-delivery on promises. Decision rules related to financial matters should be centralized and stress frugality. Operationally, business lines can be decentralized to assure accountability and delivery on promised budget metrics, but the performance management system should reward collaboration across businesses and deployment of best practices through support for shared supply chain and technology services.

We were able to relate enterprise value at 12/31/2013 to intrinsic value (NPV of expected cash flows discounted at the company's cost of capital) for most companies. We also found a positive relationship between TSR and Board strength in terms of its concentration of members with oil and gas or OFS experience.

Two companies (TGS Nopec and FMC Technologies) appear undervalued relative to past performance. TGS Nopec enterprise value has increased in the first half of 2014, and the value discrepancy has been reduced; FMC Technologies may be perceived as vulnerable to loss of market share in its core subsea equipment segment. Seven companies appear potentially overvalued. Expectations for Oceaneering and Dril-Quip suggest accelerating growth in their core subsea niches, some of which may be at the expense of FMC. There appear to be high (perhaps too high) expectations for successful turnarounds under way at Weatherford, ION, and Nabors. Expectations are also high for improved profitability at Tidewater following renewal of its fleet. Baker Hughes may be valued in the market on the assumption that it will reduce its capital spending to match proportionately its larger rivals.

Overall, the relative success of the TGS “asset light” strategy and the high TSR of the Specialized Equipment Manufacturers set up some interesting strategic questions:

- How can companies in the Seismic and Majors segments lower their capital intensity or increase their margins and at the same time reduce risk?
- How can the Drillers and Offshore Construction segment members increase growth without overspending on new vessels and rigs? Would mergers improve their bargaining power relative to their customers?
- How can the Specialized Equipment Group expand their technical development pipelines to invent and commercialize more new distinctive, high margin products?
- Which companies might be more valuable if they severed equipment from services by spinning-off internal Specialized Equipment manufacturing units (and related R&D) into new companies and leasing rather than owning the equipment needed to provide their services?

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- What new services can the Majors add by internal development or selective acquisitions to further increase EBITDA/ Total Assets Returns? Might there be strategic or operational synergies with divisions already in their portfolios?

These conclusions set out to explain the drivers of past performance. It is justifiable to question whether the same drivers will apply in the future. For example, if oil prices were to fall substantially, this would lower demand for oilfield services. This would in turn lower overall revenue growth and probably put pressure on margins in all segments. However, the drivers of TSR for the Majors and Seismic sub-sectors would likely stay the same with an intensified focus on returns leading to synergy capture through mergers and acquisitions (at lower valuations than today). The Drillers and Offshore Construction segments would be pressured on Growth and Returns and would likely be obliged to consolidate. The Specialized Equipment segment would be under pressure to standardize and commoditize their products and lower margins; the only defense will be to continue to develop products that are considered “priceless” and enable development of difficult resources at lower costs. If oil prices remain at current levels, there will be a continuing need for new technologies and high operational performance from the OFS Sector.

3. OFS Sub-Sector Analysis

The students formed five teams, each studying one sub-sector of the OFS industry:

- Geophysical equipment, data acquisition and processing (Geophysical)
- Onshore and offshore drilling contractors (Drilling)
- Equipment manufacturers (Equipment)
- Offshore services and supplies (Offshore)
- Broad portfolio of services (Majors)

Each team studied five companies. We lay out below the TSR performance of the companies in each group, the principal drivers of TSR, and some observations that derive from comparison of end 2013 Enterprise Value (EV) with Intrinsic Value (IV) calculated from our standard cash flow model.

The inferences drawn from Table 2.2 are that EBITDA/ Total assets drive TSR for all the segments; that revenue growth is also important for Drillers, Offshore (positive driver) and Equipment (negative driver); and that risk matters for the Seismic and Majors segments but not for the others.

- TSR for the Geophysical and Majors (excluding COSL) sub-sectors is driven by Returns and Risk (Beta). TSR in the geophysical Sub-Sector was most strongly dependent of Return on Assets and on Risk; for the Majors, Return on Assets is the strongest driver of TSR.
- TSR for the Drilling and Offshore Construction segments is driven positively by Growth and Returns, with TSR in both Sub-Sectors most dependent on growth.
- TSR for the Equipment segment shows Returns as a positive driver and Growth as a negative driver.

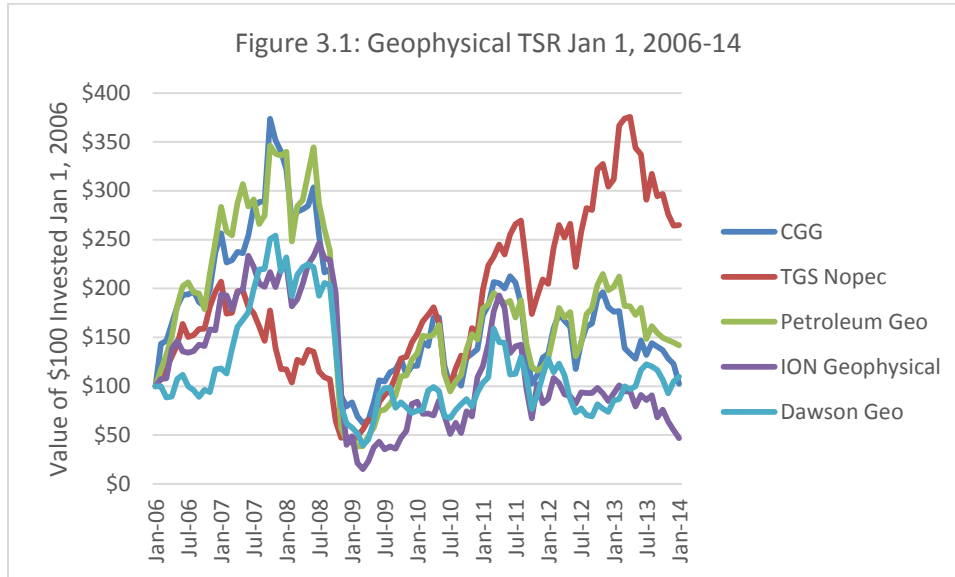
3.1 Geophysical

In the geophysical sub-sector, the five companies studied were in order of 2005-13 TSR (Figure 3.1):

- TGS Nopec (TGS)
- Petroleum Geo Services (PGS)
- Dawson Geophysical Company (DWSN)
- CGG Veritas (CGG)
- ION Geophysical Corporation (ION)

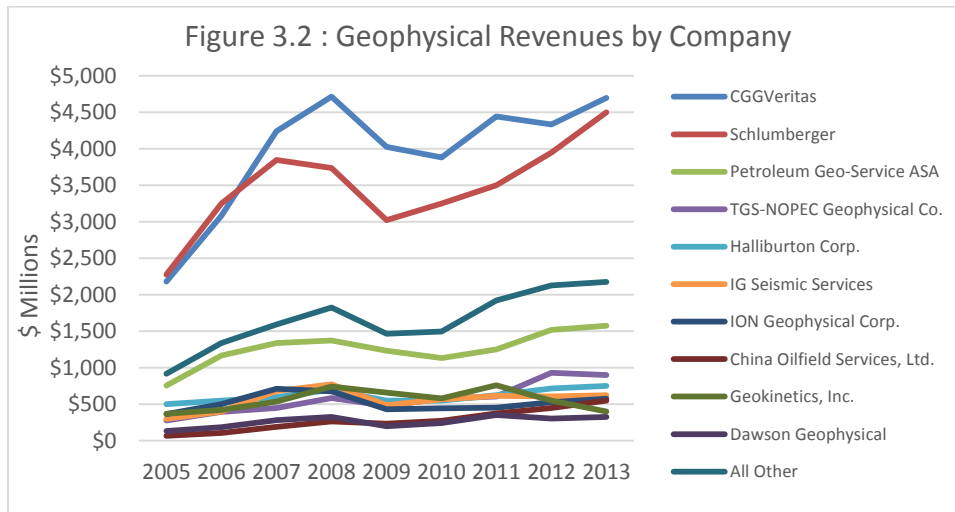
All the Geophysical companies struggled in the recession as exploration budgets were cut back and shareholder value declined; those exposed to the Gulf of Mexico also lost shareholder value in 2010. TGS recovered most strongly (Figure 3.1).

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Source: S&P Capital IQ

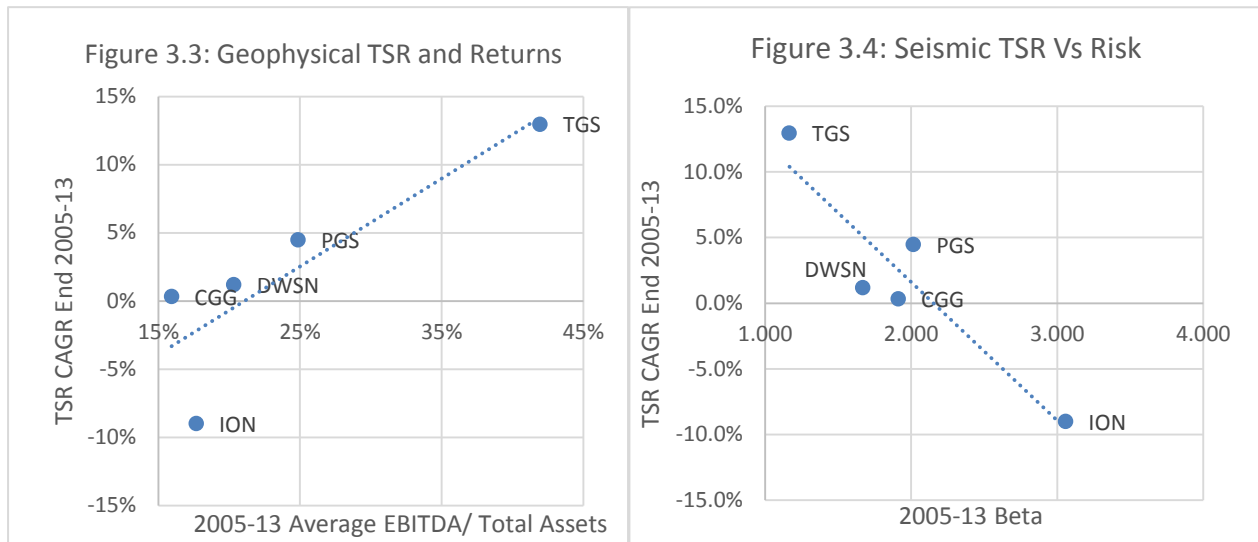
Worldwide geophysical Sub-sector revenues grew by 9.7% pa from 2005 to 2013. CGG Veritas held the highest market share (Figure 3.2) followed by Schlumberger.



Source: Spears & Associates

Return on Total Assets has been the most important driver of TSR in the Seismic sub-sector (Figure 3.3). Companies with good margins and low book assets outperformed those with larger asset bases. A key determinant of asset intensity is engagement in seismic equipment manufacturing and sales. Risk (beta) also explains some of the differences in TSR (Figure 3.4) indicating that investors reward a high level of profitability **and** low risk.

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Source: S&P Capital IQ and GEMI Research

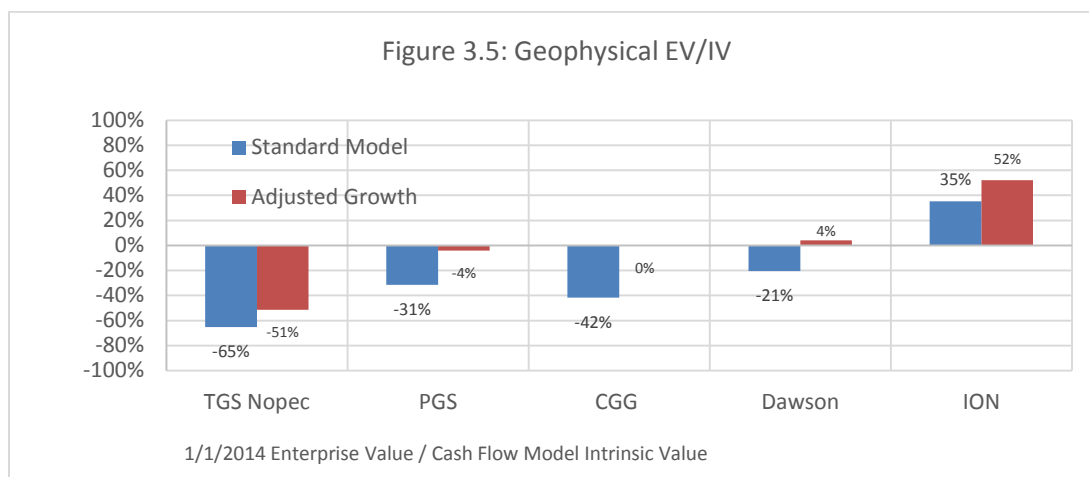
TGS Nopec has led its rivals through an “asset light” model and a strategy of aggressively targeting emerging international exploration plays in advance of its rivals and upgrading its library of seismic information. By contrast, ION and CGG TSRs were weighed down by relatively large, low growth and low return businesses in manufacturing and selling equipment for acquiring geophysical data. Table 3.1 displays the participation by the five companies in the different seismic business segments. ION has been transforming itself from primarily an equipment manufacturer to primarily a data processor and progress has been uneven, resulting in low TSR relative to its revenue growth and returns.

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Table 3.1: Participation in Geophysical Business Segments

	ION	CGG	PGS	DWSN	TGS
Equipment Manufacture	X	X	X		
Acquisition		X	X	X	X
Analysis	X	X	X		X

Our standard model for calculating intrinsic value does not match well to 1/1/2014 Enterprise value (Figure 3.5). Most companies have intrinsic value higher than market value, while ION is valued below market value. Our interpretation is that the market is bearish on the future growth in demand for geophysical services and does not believe that overall market revenue growth can continue at the rates seen in recent years (Table 3.2). Our standard model already applied the lower 2012-13 growth rate (6.6%) of total segment revenues going forward rather than the higher 2005-13 growth rate used for the other segments (which would have been 9.7% p.a. for geophysical services), yet still overvalued the three large international companies (TGS, PGS and CGG) relative to the market enterprise value.



Source: S&P Capital IQ and GEMI Research

The market appears to be assuming a future overall geophysical market revenue growth rate of about 1% p.a. for CGG and PGS, indicating a belief that the boom in international demand for (principally marine) geophysical services from 2005 through 2013 has come to an end. It is surprising that TGS should be a highly discounted stock even in a low growth scenario, in light

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of its successful asset light business model. Investors may have been applying a higher discount rate to TGS because it does not own its seismic data acquisition equipment or may believe that the asset-light business model is not sustainable. Investors may also have been concerned by a drop in earnings from 2012 to 2013, while CGG and PGS both showed increases. However, TGS EV improved in the first half of 2014 by 17% while other companies continued to decline perhaps indicating that investors are recognizing that TGS has been undervalued and that their concern over lack of control of data acquisition equipment may have been exaggerated.

Table 3.2: Comments on Over-Undervaluation Compared to Standard Model

	EV/IV	Overall Market	Company Specific
TGS Nopec	(65)%	Low growth (1% p.a.) expected for international market for seismic data acquisition and processing	Unsustainable business model?
PGS	(31)%		
CGG	(42)%		
Dawson	(21)%	More robust growth (5.0% p.a.) in North America	Potential for micro-seismic in shales?
ION	35%		Continued turnaround?

The enterprise value of Dawson is justified by calculated intrinsic value if overall North American revenue growth for the segment is 5% p.a. implying growing demand for micro-seismic data acquisition, processing and imaging. ION's enterprise value seems to assume a substantial turnaround in financial performance.

Geophysical Company Reviews

TGS NOPEC (OB: TGS) was formed in 1998 through the merger of Norwegian TGS and U.S. based NOPEC. The company grew its services by acquiring a series of software companies to strengthen its processing and imaging capabilities and adding to its data library.

- 1981** NOPEC was formed in Norway, with business focused on acquiring quality, multi-client seismic data in the North Sea and other regions around Europe, and eventually Africa.
- 1981** TGS was formed in the US, with business focused on acquiring quality, multi-client seismic data in the Gulf of Mexico.
- 1990** TGS and NOPEC build upon their regional data libraries of high quality multi-client 2D and 3D seismic surveys.
- 1997** NOPEC becomes listed on the Oslo Stock Exchange.
- 1998** TGS acquired Bedford Interactive Processing to obtain their data processing resources.
- 1998** TGS merged with NOPEC to form a global suite of multi-client North America and Europe/Africa seismic surveys.

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- 2002** TGS purchased A2D Technologies (Houston) and acquired the industry's largest online collection of well log data.
- 2004** TGS acquired NuTec Energy (Houston) to obtain their large-scale in-house 3D processing and imaging capabilities.
- 2005** TGS acquired Aceca Geologica (London) to be able to offer multi-client interpretation studies that integrate their suite of geophysical and geological products.
- 2007** TGS acquired Parallel Data Systems (Houston) to add to their imaging services high performance and accurate 3D pre-stack depth services, time migration and converted wave.
- 2010** TGS acquired directional survey business unit of P2 Energy Solutions' Tobin business line. This added a large database of high quality, standardized directional surveys to TGS' collection of well data.
- 2011** TGS acquired Stingray Geophysical Limited in order to establish a strong position in the rapidly growing market for Permanent Reservoir Monitoring (PRM) solutions.
- 2012** TGS acquired Arcis Seismic Solutions (Calgary) in order to grow into the onshore multi-client and imaging businesses in Canada and other markets served by Arcis.
- 2012** TGS acquired Volant Solutions (Houston) in order to obtain integration solutions for E&P companies to address the challenges of managing geotechnical data.

TGS-NOPEC currently has four main business lines: Geophysical Multi-Client Data, Geological Multi-Client Data, Imaging Services, and Reservoir Solutions. The multi-client data products involve both collecting non-exclusive data and licensing it to customers in order to spread the costs of collecting and holding the data. When new data is collected, it is usually entered onto the balance sheet as a non-current asset and amortized over the economic lifespan of the survey. New data which the company collects has a lifespan of 7 years. The Acris multiclient library is being amortized over 5 years. Other acquired data bases are being amortized over their original lifespans, with the industry standard being between 4 to 8 years.

The primary growth strategy for TGS-NOPEC is to focus on high quality deliverables, competitive marketing, and to capture synergies through their extensive data libraries and their multi-client seismic data business. High quality deliverables are expected to be created using their new processing method called Clari-Fi. This method can be applied not only to current and future data collection projects, but also to historical projects stored in TGS-NOPEC's data library.

TGS-NOPEC declares that it wants a board that is balanced between industry insiders, and those with broader experience. As such, they seem to have struck an excellent balance between the two. The annual reports list the board as consisting of six directors, five of which are independent. The website lists seven members, six of which are considered independent. Five of the seven members are all upstream oil and gas industry insiders with extensive experience in different technical and executive roles. One member has extensive downstream energy experience. The seventh member who is not listed in the annual reports, has served as

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the CFO to several companies and a strong finance and accounting background. The average rating of the seven board members is 2.7.

The large discount of Enterprise value compared to calculated intrinsic value suggests that investors are skeptical that TGS Nopec's asset-light model can support continued profitable growth. The company will need to develop more persuasive arguments that it can continue to capture market share from CGG and PGS.

Petroleum Geo Services (OB: PGS) was founded in Norway in 1991 and describes its progress mainly in terms of innovations in offshore seismic data acquisition.

1991	PGS is registered on the Norwegian companies register. Geoteam and Precision Seismic merge to form Petroleum Geo-Services (PGS).
1992	PGS is listed on Oslo Stock Exchange
1993	Initial public offering in the United States
1997	PGS is listed on New York Stock Exchange
2002	Pertra becomes operator on Varg Field
2002	PGS appoints new Board of Directors
2003	PGS emerges from Chapter 11
2005	Full refinancing complete
2006	Demerger of Petrojarl completed. PGS is once again a dedicated geophysical service company
2007	GeoStreamer is launched capturing market interest
2008	Ramform Sovereign sets new industry record deployment of 17 streamers
2009	World's first 3D seismic survey in the Arctic, acquired using GeoStreamer technology.
2009	PGS sells Onshore to Geokinetics
2010	Fleet expansion and renewal program begins
2011	PGS enters into a million kroner agreement with The Norwegian Academy of Science and Letters to support mathematics initiatives in Norway and Africa.
2012	10-year agreement with NAMCOR for acquisition of 2D and 3D MultiClient seismic offshore Namibia.
2013	PGS completes simultaneous acquisition of 3500 km Towed Streamer EM and 2D Seismic in the Fastnet Basin, Ireland

The company offers a broad range of products, including seismic and electromagnetic services, data acquisition, processing, reservoir analysis and interpretation, and multi-client library data. PGS has a presence in over 25 countries with regional centers in London, Houston and Singapore. The headquarters is in Oslo, Norway and the PGS share is listed on the Oslo stock exchange (OSE:PGS).

PGS claims the most flexible fleet of high-capacity streamer vessels in the world; with the GeoStreamer GS, the company has changed the principles of towed streamer seismic. Whereas conventional hydrophone-only streamer surveys were acquired with a variety of geometric configurations (e.g. swath/racetrack shooting, HD3D, multi-azimuth, wide-azimuth, rich-azimuth, full-azimuth), all associated datasets were contaminated with source and

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receiver ghosts, penalizing low and high frequency content, and obscuring seismic signals from complex geology. GeoStreamer GS applied to appropriate survey templates now allows PGS customers to realize all the key goals of 3D and 4D seismic. Additionally, since 2009 PGS has focused its attention on offshore surveys, helping companies around the world in over 25 countries.

PGS is a global company with worldwide processing centers linked by GeoNet, and a team of highly experienced experts. This allows the rapid development and sharing of innovative solutions to any geophysical challenge, and for the standardization of workflows across all centers. PGS Reservoir Services provides sub-surface advice to oil and gas companies and governments through its fully integrated G&G team of 80 geoscientists based in London, Houston, Almaty, Oslo, Perth, Rio de Janeiro and Singapore.

The PGS Board includes upstream industry and non-industry members but does not score as highly (2.3/3.0) as the TGS Board (2.7/3.0).

PGS enterprise value is well explained by calculated intrinsic value assuming a lower than historical growth in overall revenues for the geophysical Sub-Sector. The company should consider whether it could create shareholder value by spinning off its fleet of seismic streamer vessels to reduce its capital employed.

CGG Veritas is the longest established company of the five studied, founded in 1931 in Paris by a member of the Schlumberger family.

1931	Founded by Conrad Schlumberger
1936	Marcel Schlumberger becomes Vice-Chairman after death of Conrad Schlumberger
1951	20th Anniversary, CGG moves into new premises in rue Fabert, Paris, France.
1953	CGG becomes a limited liability company
1956	SMG is created as an offshoot of the electronics department of CGG
1958	CGG's first dual vessel marine survey, with one boat as source, initially using an underwater dynamite charge, and a second boat towing the streamer recording the seabed reflections.
1960	CGG uses 'multiple coverage' technology to analyze traces, and develops 'Dropter', the first non-explosive seismic source technique. An airborne survey department is launched.
1962	SMG is renamed Sercel and introduces the AS 626, a 24-trace transistor amplifier
1963	Introduction of 'deconvolution' in data processing – the filtering of data to eliminate distortion of the signal – also requiring increased processing power.
1966	CGG opens its first seismic data processing center in Massy, France.
1967	CGG installs EMR computers, and wins award for Excellence in Export. Digital Consultants deploys its first land seismic crew.
1968	In Calgary, CGG opens its first data processing center outside France.
1969	CGG develops a 'migration' processing algorithm.
1971	CGG introduces 3D seismic exploration with 'wide-line profiling' and is the first contractor to tow three parallel streamers.
1977	CGG opens data processing center in Houston, USA.
1978	CGG performs its first 3D survey in the North Sea
1981	CGG's 50 th Anniversary and they are listed on the Paris Stock Exchange and introduces combo crews (combined vibroseismic-explosive crews)
1984	In Massy, France, CGG installs the largest computer of the time, the Cray 1S.
1985	Claude Sarocchi becomes Chairman and CEO of CGG.
1986	CGG installs its first satellite data link between French and UK data processing centers.

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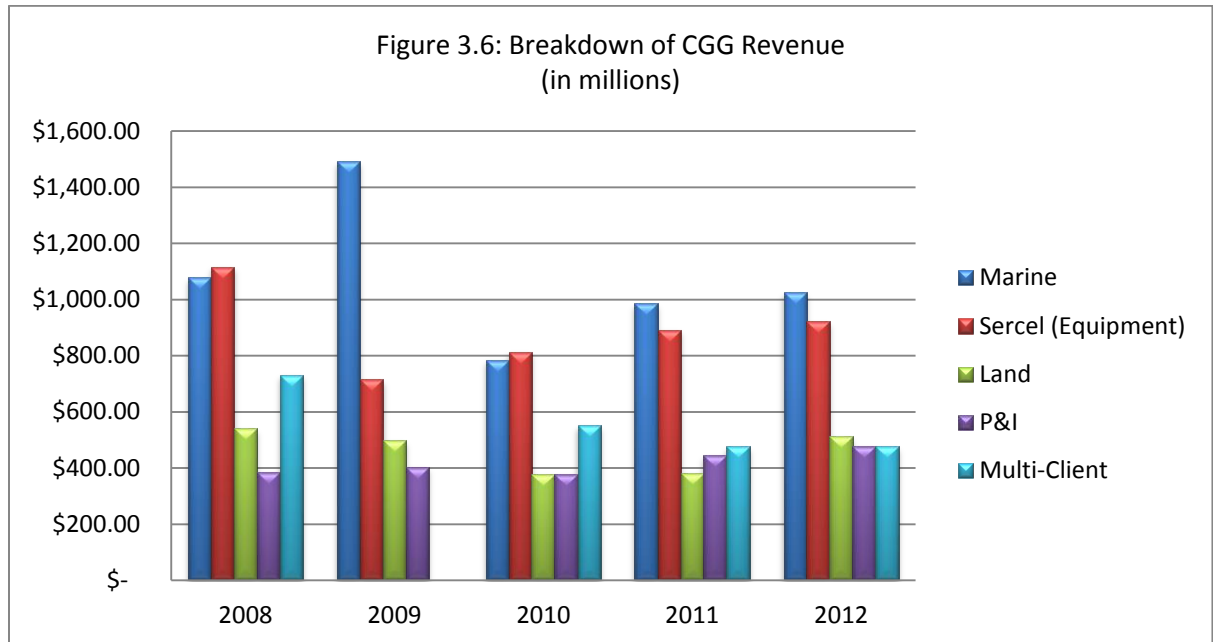
1994	CGG carries out the first 4D seismic surveys.
1997	CGG is listed on the NYSE
1998	CGG carries out offshore surveys in the Gulf of Mexico
1999	Robert Brunck becomes Chairman and CEO
2001	CGG purchases 2 seismic survey vessels and multi-client data from Aker Maritime
2003	CGG starts to use cluster computing
2004	CGG launches WaveVista, a wave equation depth imaging software
2005	CGG launches its Eye-D reservoir solutions service and acquires Exploration Resources
2006	CGG celebrates its 75 th Anniversary and enters into a definitive merger agreement with Veritas DGC.
2007	CGG and Veritas DGC combine to create CGGVeritas
2009	CGGVeritas acquires Wavefield Inseis, a Norwegian competitor and they complete acquisition of a seismic survey Sumatra
2013	CGGVeritas acquires Fugro's Geoscience Division and becomes CGG.

The company operates in 70 countries and is a fully integrated geoscience. At the end of 2013 they operated forty two processing and imaging centers including thirty international and regional centers. Their business is divided into 3 segments – Equipment, Acquisition and Geology, Geophysical and Reservoir:

- CGG's equipment division includes Sercel and other business entities including Optoplan, Metrolog and GRC. Sercel is a world leader in designing and manufacturing seismic equipment and reservoir monitoring instruments. Sercel's main clients are oil field service companies that need exploration and reservoir monitoring for land, marine, ocean bottom and downhole environments.
- CGG has a wide range of data acquisition capabilities that allows them to undertake all types of geophysical surveys. They have the largest high end marine fleet in the industry with ships capable of recording seismic, magnetics and gravity data in the most challenging offshore environments. Their recent acquisition of Fugro's Geoscience division has made them a leader in the growing seabed market offering Ocean Bottom Node and Ocean Bottom Cable. CGG also has highly experienced land crews and is a recognized leader in airborne data acquisition.
- The GG&R division of CGG offers processing, imaging and interpretation of geophysical data. They offer high tech software and services through their Hampton-Russell and Jason groups. These services include geophysical interpretation, seismic reservoir characterization, reservoir modeling and structural interpretation. CGG is well known in the satellite mapping industry with their NPA Satellite Mapping through which they supply satellite images and personalized mapping services.

CGG Revenues have grown modestly since the acquisition of Veritas in 2007 (Figure 3.6) with revenues from multi-client studies in decline.

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Source: Annual Reports, GEMI Research

CGG's vision is to be a completely integrated Geoscience company that can offer their clients a range of services and capabilities. They want to offer their clients exceptional customer service and be technology innovators. They want to create value for their clients by optimizing the discovery of natural resources both onshore and offshore. They also have a strong focus on implementing high safety and health standards along with strong ethics.

CGG has had an aggressive M&A strategy in which they focused on expanding their capabilities and becoming a completely integrated geoscience company. They have continued to focus on customer service as well as developing pioneering technology. After having dealt with the economic recession and the contracting seismic market, in 2010 CGG decided to streamline the company around five divisions and six functions to help them improve client relationships and operational efficiency. At the same time they also split the Chairman and CEO functions with Jean George becoming the new CEO.

In 2012 CGG developed a new tagline, "Passion for Geoscience" and a goal to simplify the company and update their priorities to the following: Integrate teams and activities, develop geoscience solutions, implement brand strategy and increase free cash flow and profitability. In order to continue simplifying the company they decided to reorganize the company around three main divisions – Equipment, Acquisitions and Geology, Geophysics & Reservoir (GGR). In addition to the reorganization, CGG strengthened their portfolio of capabilities by acquiring Fugro's GeoScience Division and Jason and Robertson.

The CGG Board comprises twelve members of which eight have upstream oil industry experience for a score of 2.5/3.0. However, the majority have gained their experience in French companies that have traditionally been subject to agency costs with a focus more on institutional preservation than on shareholder value.

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CGG enterprise value is well explained by calculated intrinsic value assuming a lower than historical growth in overall revenues for the geophysical Sub-Sector. The company should consider whether it could create shareholder value by spinning off Sercel and other equipment manufacturing divisions.

ION Geophysical is in the midst of major change that has been under way since Robert Peebler became CEO in 2003 to move from largely a manufacturer of seismic acquisition equipment towards a company more focused on data processing and imaging services.

1968	Founded as Input/Output (I/O) , a provider of specialized seismic synchronization equipment.
1988	Introduced System One , one of the first cost-effective land-based 3D seismic acquisition systems.
1991	Introduced System Two , second generation land-based 3D seismic acquisition system.
1991	ION becomes publically traded on NASDAQ .
1994	ION is listed on NYSE .
1994	Acquired the cable and connector groups of Tescorp . Provided ION with cables necessary to operate land-based acquisition systems.
1995	Acquired Western Geophysical Exploration Products Group . Provided ION with marine seismic recording systems, vibrator source products and geophone products.
1997	Acquired Green Mountain Geophysics . Provided ION with interactive geophysical software support, training and consulting for seismic survey design and planning. Also acquired seismic survey planning software MESA .
1998	Acquired DigiCourse . Provided ION with marine positioning systems for streamer and seabed seismic acquisition.
2001	Acquired Pelton Company . Provided ION with land-based energy source control systems including seismic vibrator control systems, vibrator positioning systems using GPS and explosive energy control systems.
2001	Introduced System Four , fourth generation land and marine-based 3D seismic acquisition system.
2002	Acquired AXIS Geophysics . Provided ION with advanced seismic data processing including anisotropic processing, amplitude variation with offset analysis and azimuthal velocity modeling.
2002	Introduced GulfSPAN multi-client library, customized survey of basin-wide, ultra deep seismic data.
2004	Acquired Concept Systems . Provided ION with real-time navigation and data integration software and services.
2004	Acquired GX Technology . Provided ION with additional seismic imaging processing and multi-client seismic libraries.
2004	Introduced VectorSeis Ocean , marine system for acquiring full-wave seismic data from the seabed.
2006	Introduced FireFly , first full-wave cable-less land acquisition system.
2007	Changed name from I/O to ION .
2008	Acquired ARAM Systems . Provided ION with cable-based land seismic recording systems.
2010	Launched INOVA Geophysical . A land based seismic equipment joint venture with BGP (49/51).

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Peebler made several acquisitions to increase the company's weighting to software and services. However, the company took on debt to buy ARAM and became unprofitable in the downturn of 2008. In 2010 ION completed a joint venture with BGP, the geosciences arm of the Chinese National Petroleum Company, by contributing most of ION's land based seismic acquisition business segment and was able to retire much of its debt. After a severe drop in 2009, revenues have grown slowly with growth in software and services as equipment sales have declined. In 2012, Peebler was replaced as CEO by Brian Hanson, who is continuing the strategy of transition towards software and services by emphasizing growth in ION's Solutions segment. The majority of its investments will be devoted toward research and development and computing infrastructure for its data processing business. The four key markets for its Solutions business include:

- Challenging environments (such as the Arctic frontier)
- Complex and hard-to-image geologies (such as deep-water subsurface salt formations)
- Unconventional reservoirs (such as those in shale-producing area)
- Basin exploration (a substantial data library that covers many of the frontier basins in the world)

ION's business strategy will also be based on six key components:

- Expanding its Solutions business in new regions with new customers and new land and marine service offerings
- Globalizing its Solutions data processing business by opening advanced imaging centers in strategic locations with emphasis on serving national oil companies
- Developing the next generation of marine towed streamer products
- Developing the next generation of seabed seismic data imaging technology
- Managing its cost structure to reflect current market and economic conditions
- Increasing market share and profitability in land data acquisition systems through its investment in **INOVA Geophysical**

ION has a small Board with seven members, of which five have upstream industry experience, including a representative from Chinese partner BGP, for a score of 2.4/3.0. It is not clear how the portfolio mix of equipment manufacture, software and services will provide a basis for future shareholder value creation.

ION enterprise value shows a large premium over calculated enterprise value and seems to reflect optimistic assumptions on the success of its turnaround and the as yet unproven contribution of the INOVA joint venture.

Value Creation by Oilfield Service Companies

Dawson (NYSE: DWSN) is a geophysical company based in Oklahoma City

1952	L. Decker Dawson launches Dawson Geophysical
1969	Use first digital recorder (DFS)
1976	Data Processing Department formed
1979	First vibrator equipment
1981	Public company under ticker DWSN
1988	240 channel 3D project (first) in West Texas
1991	First telemetry crew
1993	Creates HSE program
1994	First radio based crew
2000	First multi component project
2004	First 5,000 channel crew (38,000 total channels)
2007	10,000 channel crew (102,000 total channels)
2010	First cableless system project
2011	18,000 channel crew (161,000 channels)
2011	First micro-seismic project

Dawson Geophysical provides strictly onshore 2D and 3D data acquisition and processing in the lower 48 states to large and small oil and gas companies and in 2013 began operations in Canada. Aside from carrying out surveys and data processing, Dawson also has services in design and permitting, project management, field operations, maintenance, survey consulting and legal and regulatory services. To carry out their operations, Dawson Geophysical purchases and owns their equipment. They have invested in items like vibrators, digital recorders, single and multi-channel units, geophones, and vehicles.

For the past 5 years Dawson Geophysical has sustained a business strategy of managing their foothold in the United States onshore market and in 2012 made it a goal to construct and expand their Canadian business segment. Dawson has in the past and present maintained these strategies by making it a priority to purchase equipment vital to their acquisition needs and making sure to implement any geophysical technological advances.

This choice to own the data acquisition equipment has resulted in relatively low EBITDA/ Total Assets returns and in low TSR.

The Dawson Board has some relevant experience, diluted by finance, accounting and consulting members for a score of 2.0/3.0.

Dawson's enterprise value is well explained by calculated intrinsic value assuming a lower than historical growth in overall revenues for the geophysical Sub-Sector. The company should consider whether it could create shareholder value by leasing rather than owning its vibro-seis data acquisition equipment.

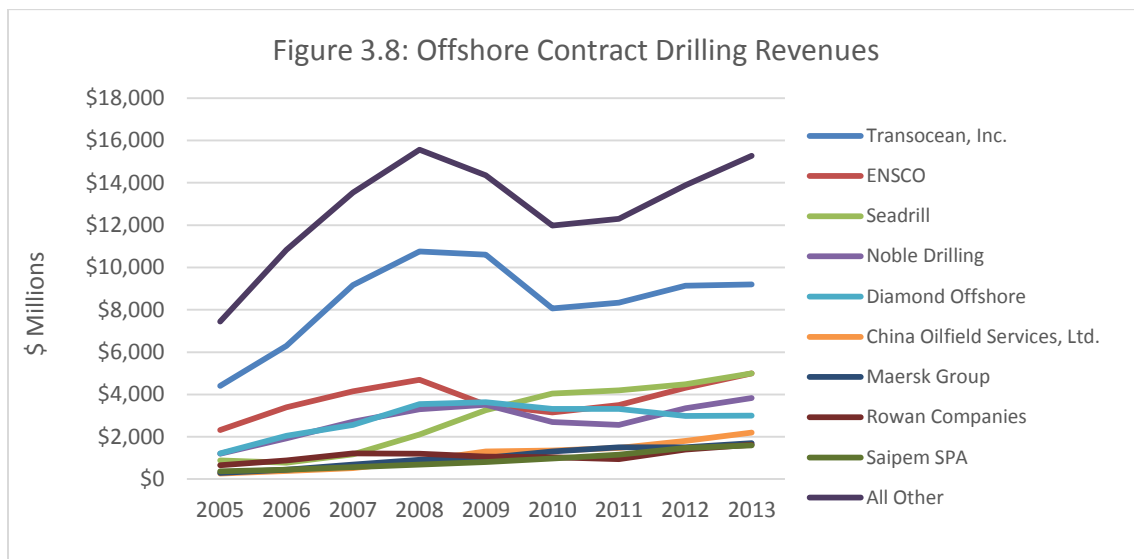
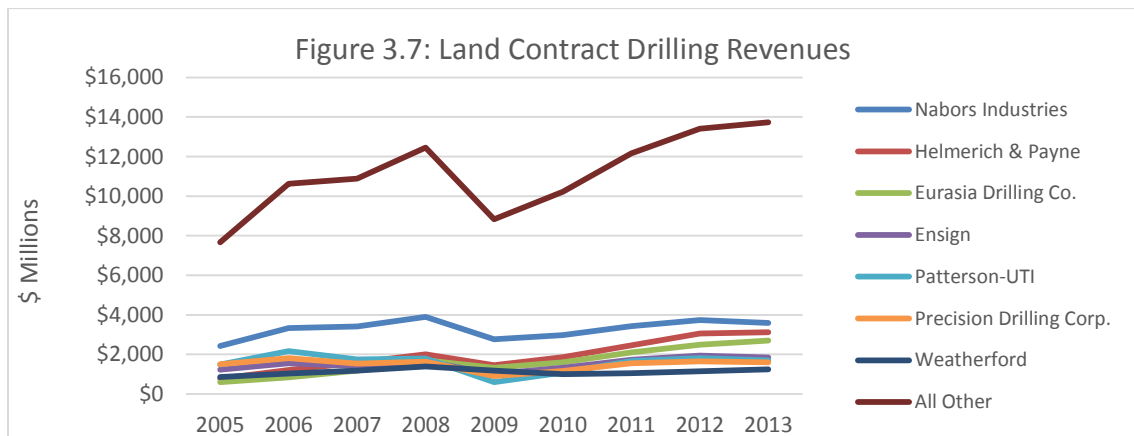
Value Creation by Oilfield Service Companies

3.2 Drilling

In the drilling sub-sector, the five companies studied were in order of TSR (Figure 3.6):

- Helmerich and Payne (HP)
- Ensco (ESV)
- Noble Corporation (NE)
- Transocean (RIG)
- Nabors (NBR)

Land contract drilling revenues grew by 7.5% pa from 2005 to 2013, while offshore contract drilling revenue growth averaged 12.4% pa. The overall land drilling industry is highly fragmented, but the segment addressing unconventional oil and gas is more concentrated and requires more powerful, technologically advanced drilling rigs and crews. Helmerich & Payne has been catching Nabors in market share (Figure 3.7).

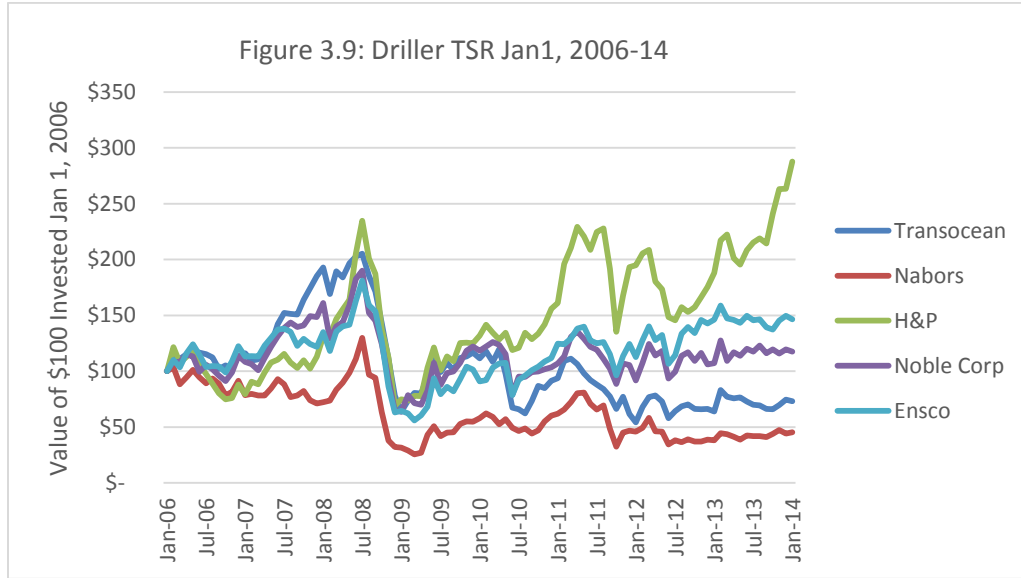


Source: Spears and Associates

Value Creation by Oilfield Service Companies

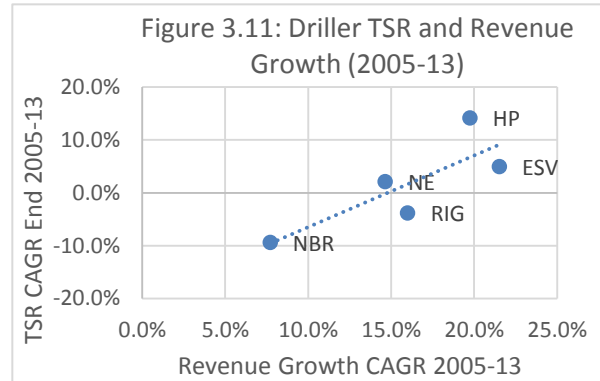
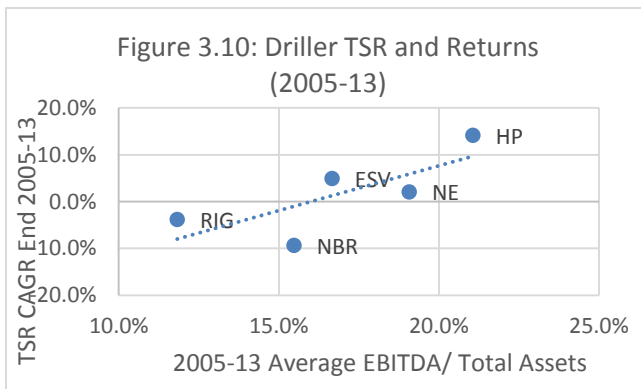
The offshore drilling industry is less concentrated, especially in the ultra-deep segment. Transocean is the leader, with Ensco capturing some market share (Figure 3.8).

Despite the high revenue growth rate, the offshore drillers were unable to grow shareholder value significantly (Figure 3.9). Helmerich and Payne, an onshore driller, performed better.



Source: S&P Capital IQ

Revenue Growth and Return on Total Assets have been the most important drivers of TSR in the contract drilling sub-sector (Figure 3.10 and 3.11). HP has generated higher revenue growth and higher returns from its onshore business than the offshore drillers. Transocean returns were hurt by the Macondo tragedy. Nabors has been losing market share.



Source: S&P Capital IQ and GEMI Research

Contract drilling is a highly competitive sub-sector. Oil companies negotiate hard to assure that the providers do not capture excess returns, which are available only during times of capacity shortage such as those realized for offshore rigs in 2008-09.

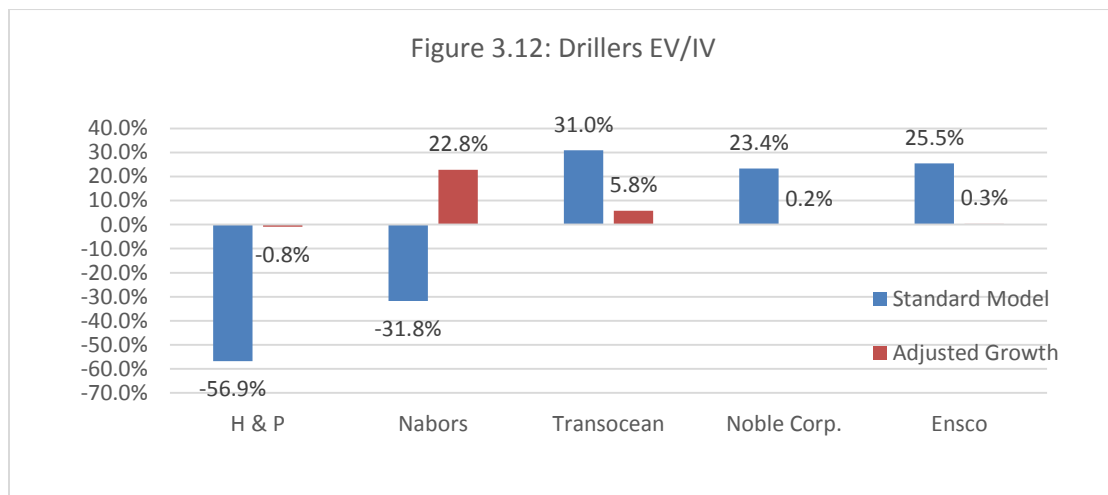
Value Creation by Oilfield Service Companies

The successful offshore strategy has been to design and build more powerful and automated rigs capable of safely drilling in increasingly deep water towards precisely defined targets that may be 30,000 feet below the sea bed and to negotiate contracts at day rates that allow a modest return on capital. A similar strategy has been successful in the onshore, where rigs need to drill multiple wells from a single pad, vertically for 10,000 feet or more then horizontally for up to another 10,000 feet, to enable well completion with multi-stage hydraulic fracturing, and then to be able to move these monster rigs rapidly to the next pad.

Until Macondo, Transocean was executing this strategy successfully, but then incurred costs and some loss of market share, primarily to Ensco. Macondo reinforced contract drillers' paramount strategic as well as operational imperative for safety. HP continues to execute a similar strategy onshore and increased its market share of onshore drilling by offering the most advanced rigs, achieving the highest growth rate and highest returns of the companies studied.

Nabors achieved the lowest growth and second lowest returns of the companies studied and has clearly incurred agency costs such as extraordinary compensation to senior executives unrelated to its feeble shareholder returns and a portfolio of businesses lacking the focus of its rivals (see Table 1.2). These behaviors have attracted shareholder activism.

Our standard model for calculating intrinsic value (Figure 3.12) overvalues the land drillers (HP and NBR) compared to enterprise value and undervalues the offshore drillers (particularly Ensco and Noble Corp.).



As for the geophysical subsector, the reasons are probably caused by investor assumptions of different revenue growth rates. Our standard model assumes continuation of growth at 2010-13 rates, which were exceptionally high for onshore drilling after the recession and atypically low for offshore due to the Gulf of Mexico drilling moratorium.

Value Creation by Oilfield Service Companies

The expected future onshore contract drilling revenue growth appears to be 3% p.a. and the offshore growth rate 13% p.a. (Table 3.3). At these overall segment revenue growth rates all the companies appear fairly valued except Nabors, where investors are apparently optimistic that financial performance will radically improve under the new CEO.

Table 3.3: Contract Drilling Revenue Growth Rates (% p.a.)

Period	Offshore	Onshore
2005-13	12.4%	7.5%
2010-13	8.5%	11.6%
Future Inferred from EV	11%	3%

These implicit growth rate assumptions appear reasonable. It is likely that offshore growth will continue to recover as Gulf of Mexico returns to full exploration activity and deep water drilling continues to grow offshore Brazil, Africa and Asia. Continued efficiency improvements may curtail growth in rig-days required in North American onshore plays, though there is upside when growth in natural gas demand (domestic and for LNG) starts to require increased drilling in natural gas shales on top of the moderate growth in rigs required for liquids rich shales.

Contract Drilling Company Reviews

Helmerich and Payne was founded in 1920 in Tulsa, OK:

1920	Founded in Tulsa by former aviator-turned-oil driller Walt Helmerich and scientist William “Bill” Payne
1924	The Braman well becomes Helmerich & Payne’s first really profitable well
1926	Officially incorporates as Helmerich & Payne, Inc. in Oklahoma.
1936	Bill Payne leaves the company to form his own venture, Big Chief Drilling Company based in Oklahoma City. The successful company was later acquired by General Drilling & Production Company in 1987.
1944	H&P restructured into White Eagle Oil Company, with the original company focusing on upstream activities only; this arrangement lasted until 1959
1960	After leading a diversification and modernization effort during the 1950s, Walt Helmerich III becomes president of the company in December.
1968	The company’s first offshore well, Spindletop, named after the famous Texas oil field that gave birth to the oil industry in the south, launches; it was damaged by a storm in 1969.
1970s-1990s	Helmerich and Payne expanded drilling operations into the South America, Africa, and the Middle east
1998	Launched its first FlexRig® land rig.
2013	H&P has record earnings year of \$6.79 per share

Value Creation by Oilfield Service Companies

Helmerich & Payne current operations includes onshore and offshore operations divided into U.S Land, Offshore, and International Land segments and real estate in the Tulsa, Oklahoma metropolitan area. The extent of its U.S Land segment operations includes 302 operating rigs in the United States, operating primarily in Oklahoma, California, Texas, Wyoming, Colorado, Louisiana, Pennsylvania, Ohio, Utah, Arkansas, New Mexico, Montana, North Dakota, West Virginia and Nevada. The Offshore segment, with 11 rigs total (8 under contract and 2 others that are customer owned with management contracts) operations are located in the Gulf of Mexico, offshore California, and offshore Equatorial Guinea in West Africa. The International Land segment operations include activities in Ecuador (6 rigs), Colombia (7 rigs), Argentina (9 rigs), Tunisia (2 rigs), Bahrain (3 rigs), and United Arab Emirates (2 rigs). The company's real estate holdings include a 441,000 square foot shopping center, warehouse properties totaling over 1 million square feet, and 210 acres of undeveloped land, all in the Tulsa area.

The company notes that it specializes in shallow and deep drilling for oil and gas in the United States and abroad. The company's customer base is diverse, including major international oil companies, larger independent oil companies, and national oil companies. BHP Billiton, Devon Energy, and Occidental Oil and Gas are some among its major contract drilling customers. BHP and Devon's contracts are domestic; Occidental is international.

Growth over the past decade has been primarily in their U.S. land segment, benefiting from the development of oil and gas plays, particularly in their Oklahoma and Texas core area. HP was early in offering more powerful and sophisticated FlexRig® rigs and captured market share from competitors. Its strategy is to continue to capitalize on its position as a leader in modern drilling rigs and continue to improve on H&P's designed and operated FlexRig®.

HP has a rather weak Board with limited industry experience for a score of 1.7/ 3.0.

HP enterprise value is well explained by calculated intrinsic value assuming a lower than historical growth in overall revenues for the land drilling Segment.

Ensco was spun out from Blocker Energy Corporation of Texas as the Energy Services Company in 1987:

1987	Founded as the Energy Services Company
1993	Acquire Penrod Drilling and Dual Drilling
1995	Changed name to Ensco and joined NYSE
1997	Started paying dividends
2002	Acquired Chiles Offshore
2009	Redomiciled in London, United Kingdom
2011	Acquired Pride International

Ensco is an oil and gas service company specializing in drilling, and is the second largest offshore oil and gas well contract drilling company. The company owns and operates an offshore drilling rig fleet of approximately 74 rigs, including 9 drill ships, 13 dynamically

Value Creation by Oilfield Service Companies

positioned semisubmersible rigs, 6 moored semisubmersible rigs, and 46 jackup rigs. Its drilling rigs are located in Brazil, Europe, Mediterranean region, the Middle East and Africa region, and the Asia Pacific rim region, as well as in the North and South America regions. The number of rigs continues to grow as 4 more rigs are being constructed currently.

With a new strategy to focus solely on offshore drilling with a premium fleet, Ensco divested marine vessels, platform rigs and the majority of barge rigs. Through new construction and acquisitions, they grew their jack-up rig fleet and entered the emerging ultra-deepwater market. The construction of ENSCO 7500, their first ultra-deepwater semisubmersible delivered in 2000, was followed by a multi-billion dollar capital commitment to eventually construct seven ENSCO 8500 Series® ultra-deepwater rigs. Ensco launched a new brand to emphasize our strategy of focusing on the ultra-deepwater and premium jackup drilling markets with a dedicated workforce that is committed to safety and operational excellence. The company redomiciled to the United Kingdom in late 2009 and opened a new global headquarters in London in early 2010. Ensco was rated #1 in total customer satisfaction in an independent customer survey.

Ensco acquired Pride International in May 2011 creating one of the world's largest offshore drilling companies with operations spanning six continents. The acquisition expanded their fleet to include drillships and gave us a significant presence in Brazil and West Africa. They announced construction of the new ENSCO 120 Series ultra-premium harsh environment jackups that are particularly well suited for work in the North Sea and ENSCO 140 Series high-specification jackups for work in the Middle East. All of the rigs are designed using Ensco's patented Canti-Leverage AdvantageSM technology that provides cost advantages for customers by allowing them to drill more wells from one location when utilizing the enhanced hoisting capacity at the farthest reach of the cantilever. We also announced construction of several drillships using the newest Samsung GF12000 model. In 2012, Ensco's growing financial stature was recognized when it was added to the S&P 500 index. Ensco has for four years been the world's #1 rated driller in customer satisfaction. Ensco's strategy is to focus solely on offshore drilling:

- invest in a high-quality fleet of ultra-deepwater drillships and semisubmersibles, premium jack-ups and moored semisubmersibles
- instill a culture that is centered on safety
- excel in day-to-day operations to maintain reputation of reliability
- provide training opportunities to ensure employees are properly equipped to excel
- apply proven systems and processes to support the business; and
- maintain a prudent risk profile in all aspects of the business.

Ensco has a mediocre Board with good industry experience diluted by several members of doubtful value for a score of 1.6/ 3.0.

Ensco enterprise value is well explained by calculated intrinsic value assuming a higher than

Value Creation by Oilfield Service Companies

historical growth in overall revenues for the offshore drilling Segment. Valuations of the three leading deep water drilling companies have fallen in 2014 suggesting a reappraisal of future revenue growth rates.

Noble Corporation (NYSE: NE) became an independent contract drilling company after the exploration and production company was spun off to become Noble Energy (NYSE: NBL):

- 1921 Lloyd Noble saw a potential for a new business when he struck oil on his farm, and purchased his first rig with Art Olson
- 1926 The company's growth soared when the Seminole oil field was discovered
- 1930 Noble and Olson went their separate ways splitting their employees, 38 rigs and equipment
- 1932 Lloyd Noble created an oil production company to complement the drilling side of business. The company created was Samedan Oil Corporation. Today we know it as Noble Energy.
- 1940 Noble was called to help with the war effort drilling England's Sherwood Forest increasing domestic production.
- 1946 Noble drilled the first well off the Atlantic coast in Cape Hatteras Island
- 1950's Early 1950's, Noble Drilling became the first company to drill offshore using electric power from shore
- 1981 Noble embarked on a new build campaign building two rigs which still operate today
- 1984 NBL sells the B. F. Walker trucking company.
- 1985 Noble Affiliates spins off its subsidiary Noble Drilling Corporation to shareholders.
- 1990's During the late 90's Noble developed rigs capable of operating in water depths of 6,000' and greater
- 2000's Noble Drilling Corporation increased its fleet with three high specification jack-ups and four ultra-deepwater semisubmersibles. The company's name was changed to Noble Corporation when it incorporated in the Cayman Islands. It reincorporated in Switzerland in 2009.

Noble is a leading offshore drilling contractor for the oil and gas industry. The company performs contract drilling with a fleet of 79 mobile offshore drilling units including semisubmersibles, drillships, jackups, submersibles, and has other ultra-deepwater rigs under construction. Noble also has its own floating production and storage and offloading unit. The company conducts offshore drilling worldwide, including U.S. Gulf of Mexico and Alaska,

Value Creation by Oilfield Service Companies

Mexico, Brazil, the North Sea, the Mediterranean, West Africa, the Middle East, India, and Australia.

Noble's goal is to be the preferred offshore drilling contractor for the oil and gas industry based upon the following overriding principles

- Operate in a manner that provides a safe working environment for employees while protecting the environment and the company's assets
- Provide an attractive investment vehicle for shareholders
- Deliver exceptional customer service through a large, diverse and technically advanced fleet operated by competent personnel

Noble's business strategy has been to grow its premium drilling fleet capable of drilling in ultra-deep waters, and to separate and spin off its shallow water fleet as a "Standard Specification" highly efficient low cost operator. This spin-off was announced in September 2013 and finally completed in August 2014. The premium fleet of Noble Corporation will own 20 floaters (12 added since 2007) and 15 jack-ups (10 added since 2007); the Standard fleet company, Paragon Offshore, will own 34 jack-ups, 8 floaters and 2 other rigs and will be spun off to shareholders in the second half of 2014. Noble plans to increase cash returned to shareholders as capital expenditures for its current fleet expansion program decline in 2015 and has increased dividend payments in 2013 and 2014.

Noble has a small, solid Board with good industry experience for a score of 2.1/3.0.

Noble's 12/31/2013 enterprise value is well explained by calculated intrinsic value assuming a higher than historical growth in overall revenues for the offshore drilling Segment. Valuations of the three leading deep water drilling companies have fallen in 2014 suggesting a reappraisal of future revenue growth rates; Noble's spin-off of its shallow water fleet, though strategically sound, has not yet yielded higher shareholder value.

Transocean (NYSE: RIG) is the largest offshore drilling contractor by revenue and traces its origins to 1950:

- 1950 Southern Production Co., a subsidiary of Southern National Gas, purchased Danciger and later began work to form The Offshore Company.
- 1953 The Offshore Company was created to design and build *Rig 51*, the world's first mobile jackup drilling rig.
- 1956 Global Marine Drilling Company commissioned the *CUSS I*, the first drillship. This rig pioneered early versions of deepwater drilling methods and technology used by today's offshore drilling fleet.
- 1960 Santa Fe became a public company with shares sold through the OTC Market. It expanded drilling operations from the U.S. to Australia and the Pacific.

Value Creation by Oilfield Service Companies

- 1963 Santa Fe became listed on the New York Stock Exchange.
- 1963 The Offshore Company acquired International Drilling Co. Ltd. of London, marking the beginning of operations in the United Kingdom.
- 1968 Schlumberger acquired a majority interest in Forex.
- 1969 *Pentagone 81* was commissioned as first semisubmersible rig built by Neptune of Forex, the French Petroleum Institute and the Hydrocarbon Support fund
- 1970 During this decade, Transocean legacy companies continued to pioneer dynamic positioning (DP) and other marine technology, better enabling rigs to better move between wells and stay on drilling locations using thrusters.
- 1971 The *Sedco 445* became the first modern self-propelled drillship. The rig operates today as the Deepwater Navigator.
- 1979 The first DP semisubmersible, *Sedco 709*, made its debut
- 1981 The Kuwait Petroleum Corporation (KPC) acquired Santa Fe
- 1984 Schlumberger purchased Sedco
- 1985 Sedco and Forex Neptune were combined into the Sedco Forex drilling division of Schlumberger.
- 1992 Offshore Company became Sonat Offshore Drilling Inc. (SODI) and began trading on the New York Stock Exchange
- 1994 SODI acquired Transocean ASA of Norway, creating Transocean Offshore, Inc.
- 1999 Schlumberger spun off Sedco Forex which merged with Transocean Offshore Inc. to become the world's largest offshore drilling contractor: TransoceanSedcoForex.
- 2001 Transocean Sedco Forex Inc. and R&B Falcon Corporation combined to form the world's largest offshore drilling contractor.
- 2001 Global Marine and Santa Fe International merged to become GlobalSantaFe Corporation, the second largest drilling contractor.
- 2007 Transocean and GlobalSantaFe merged as the world's largest offshore drilling contractor.

In addition, the company's ultra-deepwater drilling rigs made their mark in the 2000s with a string of world records.

Value Creation by Oilfield Service Companies

Transocean provides oilfield services to its customers including offshore drilling, equipment and personnel. It has 18,400 employees and offices in 20 different countries. Transocean is a worldwide company providing a fleet of mobile offshore drilling units to help clients find and develop oil and gas reserves. Its main service is the lease and operation of semi- submersible, jack- up drilling rigs and drilling ships.

Having created scale through a series of mergers and acquisitions, Transocean has worked hard to create a common set of values and culture and publicizes this on its web site through its Vision and core values:

Vision: Transocean will be universally recognized for innovation and excellence in unlocking the world's offshore resources:

- We will be our customers' trusted partner and their preferred solution provider.
- We will conduct our operations in an incident-free workplace, all the time, everywhere.
- Our people's passion and commitment to overcoming challenges will be our trademark.
- We will deliver outstanding value to our customers, our employees, and our shareholders.

Core Values: We want to create an environment in which different cultures can interact in a positive way to create a competitive advantage, and we will be united by our commitment to our core values of Transocean FIRST, which stands for:

- **Financial discipline:** Our decisions will be made to ensure long-term growth for the benefit of employees, customers and shareholders.
- **Integrity and honesty:** Our actions will be conducted following the highest standard of ethics, honesty and personal integrity. This will foster and maintain trust and confidence of our employees, customers and suppliers.
- **Respect for employees, customers and suppliers:** Our employees will be developed and motivated to meet the challenges ahead. Individuality and diversity will be valued and performance recognized. We will provide our customers with unsurpassed value-added service. Our relationship with suppliers will reflect respect, understanding and sound business practice.
- **Safety:** Personal safety and employee health is our greatest responsibility, followed by the protection of our environment and company property.
- **Technical leadership:** Our competitive advantage is based on continually improving our processes and finding innovative solutions to the technical challenges in meeting the needs of our customers.

The vision and values have been particularly important in the aftermath of the Macondo tragedy.

Value Creation by Oilfield Service Companies

Transocean strategy is to continue to upgrade and grow its rig fleet with an emphasis on ultra-deep water and harsh environment while maintaining capital discipline. The company has filed for an IPO of Transocean Partners, LLC, a master limited partnership with partial ownership in three of its rigs. This venture will attract new capital seeking tax advantaged yields and increases Transocean's financial flexibility.

Transocean Board includes two members from activist investor Icahn Capital, which inflates the proportion of financial rather than industry membership to form a weak Board (score 1.6/3.0) with little experience to challenge management's strategic and operational pathway. Such a Board is likely to favor short term financial engineering over long term investments in technical and operational excellence, though the allocation of some rigs to an MLP has merit as a way of increasing yields to shareholders and lowering overall tax burden.

Transocean's 12/31/2013 enterprise value is well explained by calculated intrinsic value assuming a higher than historical growth in overall revenues for the offshore drilling Segment. Valuations of the three leading deep water drilling companies have fallen in 2014 suggesting a reappraisal of future offshore drilling revenue growth rates.

Nabors (NYSE: NBR) is the worst performer among the drilling contractors studied, becoming a case study in weak corporate governance and agency costs:

- 1952 Founded by Claire Nabors
- 1963 Drilled the discovery well for ARCO in Alaska which became the Prudhoe Bay Field on Alaska's North Slope. Went on to drill BP's first successful well in that field
- 1960s Pioneered the use of camps to support drilling activity and developed modular rigs and moving systems
- 1974 Acquired by Anglo Energy
- 1986 Gene Isenberg and Marty Whitman acquired a large position in the company by convincing creditors to trade debt for equity, which strengthened the then weak financial position
- 1986 After the acquisition, Isenberg and Whitman changed the name back to Nabors
- 1988 Chairman and CEO Isenberg acquired Westburne Drilling, and international company, with operations in the Middle East
- 1990 Acquired Loffland Brothers Drilling and opened up the Houston Corporate office
- 1993 Acquired Grace Drilling, adding 167 rigs to their fleet
- 90s Acquired Canrig, which put Nabors into the drilling equipment business
- 90s Acquired Sundowner and expanded operations to offshore drilling
- 1997 Purchased Epoch Well Services, which grew Nabors in the instrumentation market
- 97-98 Acquired 13 other companies
- 1999 Acquired Pool Energy Services, which brought Nabors into the well servicing business, extending the company's presence internationally, especially in Saudi Arabia and Mexico

Value Creation by Oilfield Service Companies

- 2000s Multiple other acquisitions help Nabors continue to grow its presence internationally and increase its share price
- 2010 Nabors largest acquisition, Superior Well Services, added pressure pumping to the company's abilities
- 2011 CEO Gene Eisenberg retires after 25 years as CEO (he died in 2014) and was replaced by Anthony Petrello.

Nabors operates mainly as a global land drilling contractor, but also offers well-servicing and workover contracts in the US and Canada. They currently operate 474 land drilling rigs in the lower 48, Alaska and Canada, and operate another 20 or so in other countries worldwide. They operate around 440 rigs for land well-servicing and workover contracts in the US and a little over 100 in Canada. They have a small footprint offshore as well, providing 36 platform, 12 jack-up, and 4 barge rigs in both the Gulf and international markets.

Nabors is also active in completion and production services including hydraulic fracturing, cementing, nitrogen, and acid pressure pumping services, owning about 800k of hydraulic horsepower in major basins in the US and Canada. They also offer ancillary support, such as engineering, transportation and disposal, construction, maintenance, well logging, directional drilling, etc. Nabors manufactures and sells top drives for a variety of drilling apps, directional drilling systems, pipeline equipment, and rig reporting software. They also hold a 51% stake in a Saudi Arabian JV, operating 9 rigs in addition to the rigs they lease to the JV.

Under new CEO Petrello, Nabors has begun to simplify its portfolio and announced an agreement to combine its Completion and Production Services Businesses with C&J Energy Services. Nabors retains a 53% interest in the combined company and receives \$940 Million cash and the new company will be led by the current C&J management team. Under pressure from shareholders, the company has also restructured compensation and severance practices to better align with business performance and has taken measures to strengthen governance.

Nabors has a weak Board with limited industry knowledge capable of challenging management (score 1.2/ 3.0).

Nabors' 12/31/2013 enterprise value represents a 22.8% premium over calculated intrinsic value, suggesting investor optimism on the new management's turnaround. Shareholder value has continued to climb in 2014 in response to its announced portfolio simplification. However, the weak Board is worrisome for a company in need of substantial cultural as well as strategic change.

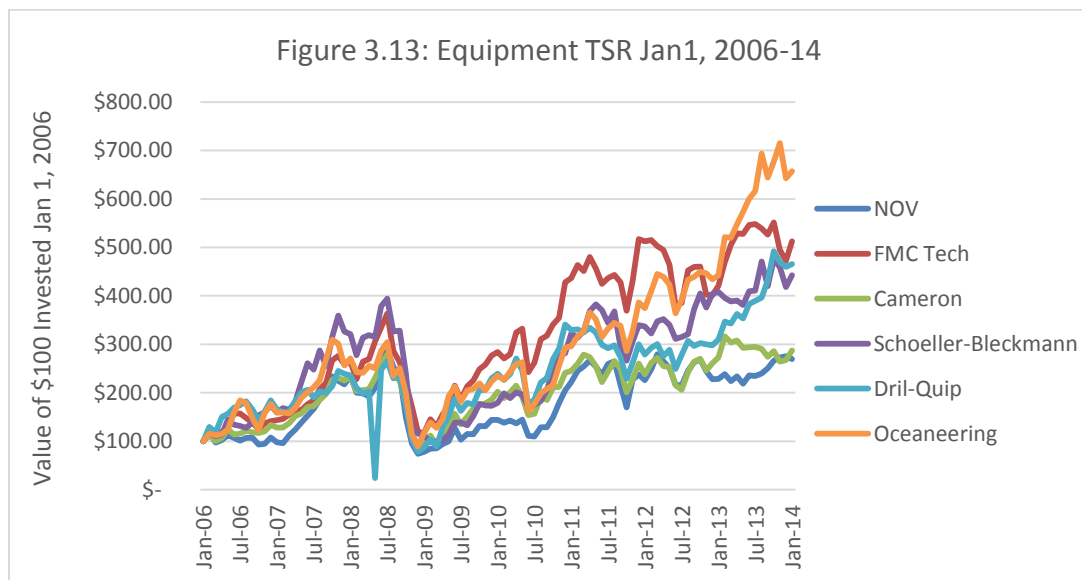
Value Creation by Oilfield Service Companies

3.3 Equipment

In the Equipment sub-sector the five companies (later amended to six to properly place Oceaneering) studied in order of TSR performance from end 2005 to end 2013 were:

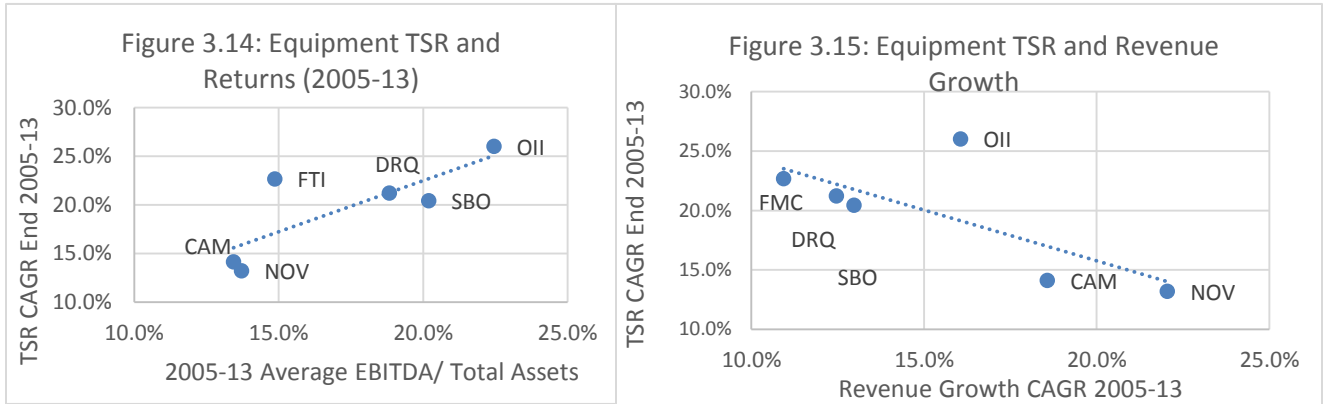
- Oceaneering (OII)
- FMC Technologies (FTI)
- Dril-Quip (DRQ)
- Schoeller-Bleckmann (SBO)
- Cameron (CAM)
- National Oilwell Varco (NOV)

Of these, Oceaneering has provided highest shareholder returns from end 2005 through end 2013. As will be seen below, each company is highly focused on a specific equipment segment.



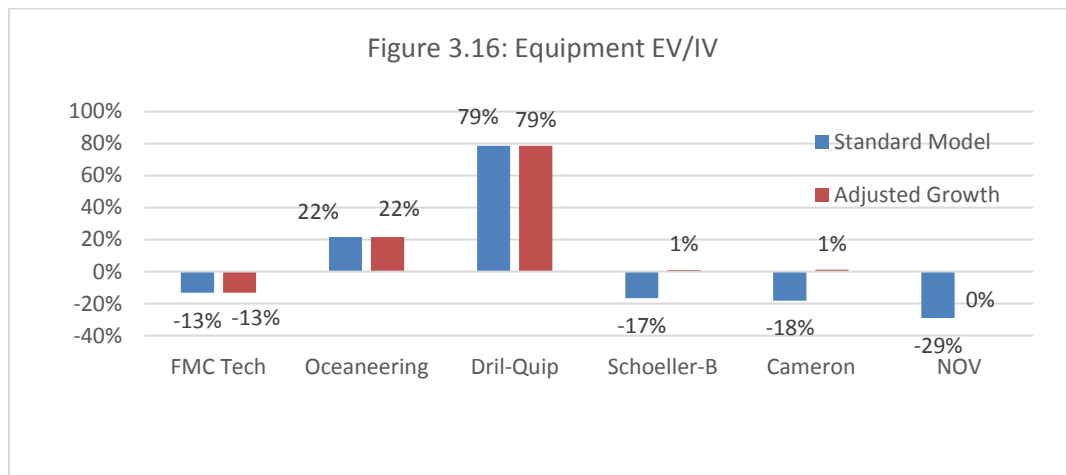
EBITDA/Total Assets returns has been an important driver of TSR in the Equipment sub-sector (Figure 3.14). TSR has also been dependent on Revenue Growth but with a negative coefficient (Figure 3.15). Companies with high returns deliver high TSR, but companies focused on revenue growth especially by acquisition have delivered weaker returns and TSR.

Value Creation by Oilfield Service Companies



The recipe for success in this sub-sector appears to be to focus on developing distinctive, high value products delivering high EBITDA returns on total assets and settle for modest organic growth in revenues. FTI, DRQ and SBO have excelled, while NOV and CAM have delivered lower value to their shareholders.

Our standard cash flow model finds that Schoeller Bleckmann, Cameron and NOV have end 2013 enterprise values that are below intrinsic value (Figure 3.16), suggesting the market believes that growth in demand for their products will be lower than it has been in the past or that their ability to generate cash from these products will deteriorate. We have adjusted the lead segments of these companies downward, so that EV and IV are aligned (Table 3.4). Of the three companies that are most focused on subsea equipment, FMC enterprise value is below intrinsic value, while Dril-Quip and Oceaneering have enterprise value considerably above calculated intrinsic value. The implication is that the market believes that FMC will lose market share to DRQ and OII.



Value Creation by Oilfield Service Companies

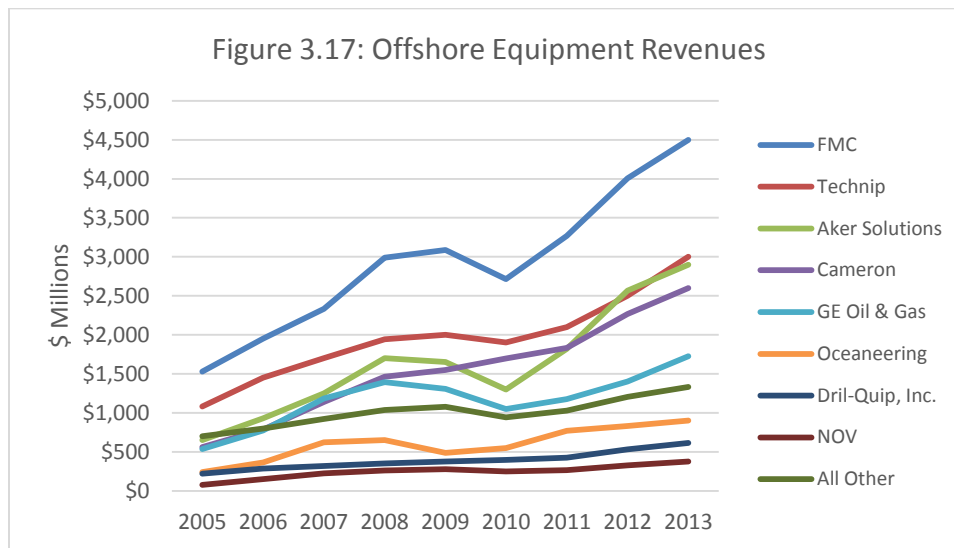
Table 3.4: Standard Model and Adjusted Lead Segment Revenue Growth Rates

	Lead Segment	Standard	Adjusted
NOV	Rig Equipment	9.8%	5.9%
Cameron	Surface Equipment	17.2%	14.5%
Schoeller-B	Downhole Tools	15.1%	12.8%
Dril-Quip	Subsea Equipment		
FTI	Subsea Equipment	18.5%	18.5%
Oceaneering	Subsea Equipment		

A reduction in revenue growth for rig equipment, surface equipment and downhole tools used primarily in land drilling seems reasonable. Investors seem confident that Oceaneering can capture accelerating growth in ROV revenues, while Dril-Quip is gaining strength in its subsea niches.

Equipment Company Reviews

FMC Technologies (NYSE: FTI) is the leader in offshore equipment market share (Figure 3.17):



1880s John Bean invents a continuous spray pump to battle scale in his almond orchards. Neighboring growers clamor for the innovative device and a new business is born.

1920s John Bean stock (FMC) introduced to the San Francisco Exchange. John Bean Mfg. Company becomes Food Machinery Corporation and citrus packing, fruit handling and treating companies are added.

1950s In 1954, Petro-Tex, a joint venture, is formed with Tennessee Gas Transmission Company to create what would later become known as Tenneco.

Value Creation by Oilfield Service Companies

In 1957, FMC acquires Oil Center Tool Company (OCT), recognized as a leading manufacturer of high-pressure wellhead flow control assemblies, also known as “christmas trees.”

1960s FMC develops underwater wellhead equipment for offshore drilling.

FMC divides its operations into four groups: Machinery, Chemical, Fiber and Film, and Ordnance.

1980s FMC makes initial investments in subsea wellhead and completion systems product lines marking the beginnings of FMC Energy Systems.

1990s Purchased Kongsberg Offshore in 1993 making FMC the world's largest subsea engineering, procurement and construction company.

Acquired National-Oilwell Fluid Control Systems in 1994.

In 1995, FMC purchased Smith Meter, the industry's leading name in liquid measurement for the oilfield industry.

FMC purchased CBV Subsea, Brazil's leading supplier to the subsea oilfield exploration industry in 1998.

The HOST template solution was developed, dramatically reducing subsea installation costs.

2000s FMC announces plans to restructure the company into two separate, publicly traded companies - a machinery business (FMC Technologies) and a chemicals business (FMC Corporation).

FMC Technologies, Inc. begins trading on the New York Stock Exchange on June 14, 2001 under the Ticker Symbol FTI.

Acquired controlling interest (55%) in CDS Engineering, a developer of unique oil/gas separation technology. Increased ownership to 100% in 2007.

Acquired in 2006 Galaxy Oilfield Service Ltd., the market leader in the supply of unique, high temperature equipment used in the thermal well production of Canada's oil sands.

FMC Technologies acquired in 2008 a 45% interest in Schilling Robotics LLC, a leading producer of ROVs (remotely operated vehicles), ROV manipulator systems, control systems, and other high-technology equipment and services for oil and gas subsea exploration and production.

Value Creation by Oilfield Service Companies

FMC acquired in 2009 Multi Phase Meters AS (MPM), based in Stavanger, Norway. MPM is a global leader in the development and manufacture of high-performance multiphase flow meters for the oil and gas industry.

2010s Announcement in 2010 of South American Technology Center in Rio de Janeiro to support Brazil's growing offshore and deepwater markets, and to support the pre-salt efforts of Petrobras and other customers.

Acquired in 2012 Control Systems International, a leading supplier of innovative control and automation system solutions for the oil and gas industry and other markets; acquired Pure Energy Services, a leading provider of frac flowback services and an established wireline services provider; formed a joint venture with Edison Chouest to provide integrated vessel-based subsea services for offshore oil and gas fields globally. Services include equipment intervention, riserless light well intervention, plug and abandonment and other services.

FMC Technologies, Inc. is one of the leading providers of technology solutions for the energy industry. They currently operate 30 production facilities in 16 different countries and have 19,300 employees.

FMC Technologies designs, manufactures and services technologically sophisticated systems and products such as subsea production and processing systems, surface wellhead systems, high pressure fluid control equipment, measurement solutions, and marine loading systems for the oil and gas industry. FMC Technologies operates in three segments: Subsea Technologies, Surface Technologies, and Energy Infrastructure.

The Subsea Technology segment accounts for about two thirds of FTI's revenues and manufactures products and provides services to oil and gas companies involved in deepwater exploration and production of oil and natural gas. Their Subsea Systems are placed at the seafloor and are secured to control the flow of crude and natural gas from the reservoir to the host processing facility (floating platform, fixed platform, or onshore facility). Schilling Robotics, LLC is also part of the subsea segment. They design and manufacture remotely operated vehicle systems (ROVs) and remote manipulator systems. The third division of the subsea business segment is multi-phase meters. These meters have applications that include production and surface well testing, reservoir monitoring, remote operation, fiscal allocation for the purpose of production and revenue sharing between partners, process monitoring and control, and artificial lift optimization. Customers of this segment include major and national oil companies as well as independent exploration and production companies. Their most recognizable customers include Shell, Statoil, BP and Anadarko. Their major competitors in this industry consist of Cameron International Corporation, GE Oil & Gas, and Aker Solutions.

The surface segment designs, manufactures, and supplies high pressure valves, pumps, and fittings used in stimulation activities for oilfield service companies, and provides fracturing

Value Creation by Oilfield Service Companies

flowback and wireline services for exploration companies. This segment accounts for about one quarter of FTI's revenues and consists of 3 divisions. Surface wellheads, or trees, are used to control and regulate the flow of crude oil and natural gas from the well. Fluid control, the second division, products are used in equipment that pumps corrosive and erosive fluid into a well during the well construction, hydraulic fracturing, or other stimulation process. The last division is completion services. This division provides fracturing flowback and wireline services. Fracturing flowback services provide the company's customers the well services necessary for the recovery of solids, fracturing fluids and hydrocarbons from oil and natural gas wells after the stimulation of the well and could involve high pressure or multi-well pad operations. Competitors in this industry include Cameron International Corporation, Weir Oil & Gas, GE Oil & Gas, and Gardner Denver, Inc.

The smaller energy infrastructure segment manufactures liquid and gas measurement and transportation equipment to customers who produce, transport, and process oil and natural gas. The products include measurement solutions, loading systems, material handling solutions, blending and transfer systems, separation systems, direct drive systems, and automation and control.

FTI is #1 in market share of subsea equipment and #2 in market share of surface equipment according to Spears and Associates.

FTI has a large (12 members) and strong Board with a great deal of relevant industry experience for a score of 2.6/ 3.0.

FMC Technologies enterprise value at 12/31/2013 shows a 13.3% discount compared with calculated intrinsic value, perhaps reflecting FMC's vulnerability as leader to market share loss from smaller companies such as Dril-Quip and Oceaneering. Its recent move to diversify into onshore fracturing flow-back services may have been seen as a digression from the value drivers of this Sub-Sector of high margin distinctive products.

Cameron (NYSE CAM): Cameron Iron Works was incorporated in Houston in 1920; in 1989, the company was acquired by Cooper Industries, which traces its origins to the early days of the industrial revolution in Ohio:

1833 : Charles and Elias Cooper foundry established in Mt. Vernon, Ohio.

1869 : Cooper licensed to produce the Corliss steam engine.

1877 : Ajax Engine Company founded.

1892 : Superior Engine and Compressor Company founded.

1899 : Bessemer Gas Engine Company founded in Grove City, Pennsylvania.

Cooper enters production of natural gas internal combustion engines.

Value Creation by Oilfield Service Companies

- 1905 : McEvoy founded to manufacture valves and wellhead equipment.
- 1919 : W-K-M valves company established in Houston.
- 1920 : Pennsylvania Process founded to manufacture compressors.
- Cameron Iron Works incorporated in Houston.
- 1929 : Cooper merged with Bessemer.
- 1934 : Thornhill-Craver established to manufacture chokes and couplings.
- 1939 : Willis formed to manufacture oilfield chokes.
- 1947 : Demco Valve Company founded.
- 1951 : Cameron Iron Works of Canada established in Edmonton.
- 1954 : Cameron purchased the British Oil Field Equipment Company of London and Leeds.
- 1955 : Joy Manufacturing Company founded in Buffalo, New York.
- 1958 : En-Tronic Controls Group established within Cooper.
- 1963 : Ajax and Pennsylvania Process acquired by Cooper.
- 1965 : Cooper Industries began major diversification program leading to major operations in electrical, automotive and tools and hardware industries.
- 1967 : Cooper Industries headquarters moved to Houston.
- 1989 : Cameron Iron Works acquired by Cooper Industries and renamed Cooper Oil Tool.
- 1994 : Cooper Industries announced intention to spin off its Petroleum and Industrial Equipment Group to focus on its Electrical Products, Automotive Products and Tools & Hardware businesses 1995.
- 1995 : Cooper Cameron Corporation spun off as publicly traded company with separate management group; Wheeling Machine Products Company's oilfield couplings business sold.
- Cameron and Cooper Cameron Valves divisions formed from Cooper Oil Tool.
- 1996 : Ingram Cactus Corporation and Tundra Valve & Wellhead Corporation acquired and combined into Cameron division; certain assets of Enox Technologies, Inc. acquired and combined into Cooper Energy Services division.

Value Creation by Oilfield Service Companies

- 1997 : Wellhead Services, Inc. and Marta Co. acquired and combined into Cameron division; Daniel Ball Valve acquired and combined into Cooper Cameron Valves division.
- 1998 : Orbit Valve International acquired and combined with Cooper Cameron Valves division; Ajax Repair & Supply, General Turbine Systems and PDQ Machine acquired and combined into Cooper Energy Services division; Brisco Engineering acquired and combined into Cameron division.
- 1999 : Rotating compressor business sold to Rolls-Royce.
- Valve Sales Company acquired and combined in Cooper Cameron Valves division; CAMCHEC acquired and combined into Cameron division.
- 2001 : Nickles Industrial Manufacturing merges with Cooper Energy Services division; Cooper Energy Services division purchases Elliot Turbocharger Group, Inc; Retsco acquired and combined into Cameron division.
- 2002 : Nutron Industries acquired and combined into Cooper Cameron Valves division; J&W and OPI Engineering acquired and combined into Cameron division.
- 2003 : Cooper Energy Services (CES) and Cooper Turbocompressor (CTC) combined into a single operating division, Cooper Compression. DPS Engineering acquired and combined into Cameron and Petreco divisions.
- 2004 : Petreco International acquired and operated as a separate division; Unicel acquired and combined into Petreco; PCC Flow Technologies acquired from Precision Castparts Corp., and combined into Cooper Cameron Valves and Cameron divisions; Mystique Ventures acquired and combined into Cooper Cameron Valves division.
- 2005 : Dresser On/Off businesses, NuFlo Technologies and St. Clair Valves acquired and combined into Cooper Cameron Valves division; EDGE product line acquired from CBI Howe-Baker and combined into Petreco; Ed's Wellhead acquired and combined into Cameron division.
- 2006 : Caldon acquired and combined into Cooper Cameron Valves division, NuFlo business; Caldon (ultrasonic measurement) into Cooper Cameron Valves division.
- Cooper Cameron Corporation name changed to Cameron International Corporation ("Cameron") (NYSE: CAM).
- Reorganizes into three business groups, Drilling & Production Systems (DPS), Valves & Measurement (V&M), and Compression Systems (CS), each with multiple business divisions aligned with upstream to downstream flow equipment market segments.
- 2007 : DES Operations Limited (subsea production enhancement) acquired and combined into Drilling & Production Systems group.

Value Creation by Oilfield Service Companies

Prime Measurement Products (measurement devices) acquired and combined into Valves & Measurement group.

Paradigm Services (actuator repair/manufacturing) acquired and combined into Valves & Measurement group.

Hydromotion Deep Bed Filter product line (filter solutions) acquired and added as the HYDROMATION product brand from Drilling & Production Systems group.

2008 : Safety Shutdown Systems (SSS) product line acquired and added as the SSS product brand from Drilling & Production Systems group.

SBS Oilfield Equipment GmbH (artificial lift equipment) acquired and added as the SBS product line from Drilling & Production Systems group.

Jiskoot Holdings Limited (oil sampling and blending) acquired and added as the JISKOOT product line from Valves & Measurement group.

Dyna-Torque, Inc (gear operators) acquired and added as the DYNATORQUE product line from Drilling & Production Systems group.

Guiberson Well Service Systems (rubber and elastomer products) acquired and added as the GUIBERSON product line from Drilling & Production Systems group.

KB Industries (surface blowout preventers) acquired and combined with Cameron's H & H Rubber Products business to result in the H & H CUSTOM, H & H MELCO and TOWNSEND product lines from Drilling & Production Systems group.

Paramount Pumps & Supplies, Inc (rod lift pumping systems) acquired and combined with Cameron's Artificial Lift business as the PRECISION product line of lift pumps from Drilling & Production Systems group.

2009 : Geographe Energy Pty., Ltd (valve management services) acquired and offered as a business from the Valves & Management group.

MaxTorque (engineered gear operators) acquired and added as the MAXTORQUE product line from Drilling & Production Systems

NATCO Group, Inc (oil, gas & water separation and treatment) acquired and combined with Cameron's Petreco Process Systems division to create Cameron's Process Systems division within Drilling & Production Systems group as well as operating units moved into Valves & Measurement group. This transaction included the following product lines TEST, CONCEPT, CYNARA, MOZLEY, NATCO, PORTA-TEST, LINCO and PAAI.

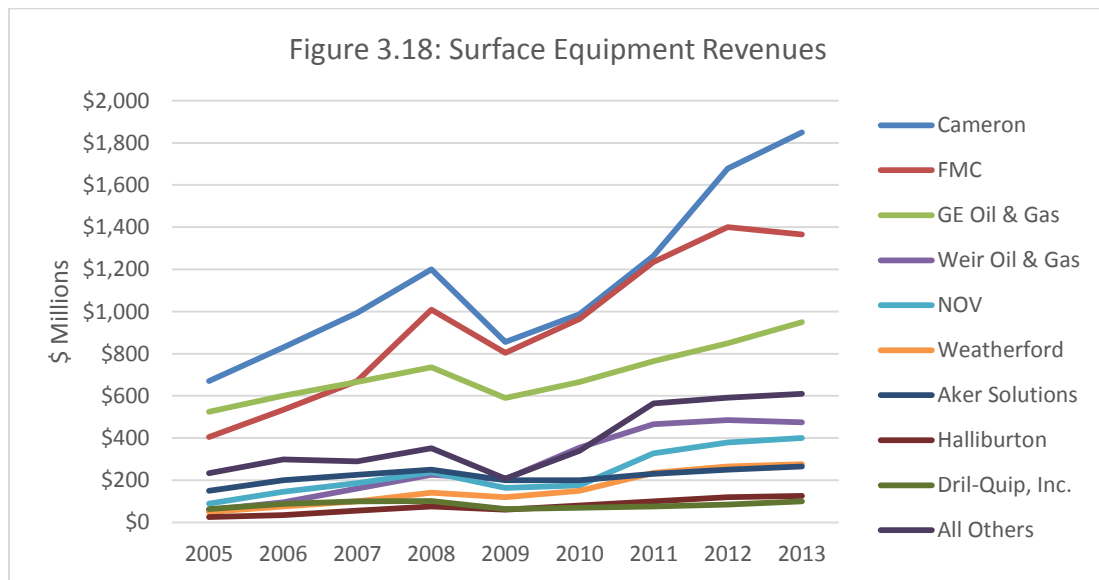
2010 : Creation of a joint venture operation between Cameron's Valves & Measurement group and Newmans Valve (downstream valve manufacturing).

Value Creation by Oilfield Service Companies

Eagle Precision Products LLC (fracturing flow back services) acquired and rolled into Drilling & Production Systems group's shale gas initiative.

Cameron International Corporation is headquartered in Houston, TX USA and operates in over 300 countries around the world. Two thirds of its business is non-US. Cameron employs over 27,000 people globally and engages in both upstream and downstream markets with over \$8 billion in annual revenues.

Cameron International Corporation provides flow equipment products, systems, and services to oil, gas, and process industries worldwide. Cameron primarily operates through three segments: Drilling and Production Systems (DPS); Valves & Measurement (V&M); and Process & Compression Systems (PCS). The company specializes in rig equipment, subsea equipment, and surface equipment. All three have overall shown steady increases in revenue from 2005-2013, except for a hiatus during the recession of 2009. CAM is #4 in market share of the subsea equipment market which provides 45% of CAM's revenues, behind FTI, Aker Solutions and Technip, but is the leader in market share for surface equipment (Figure 3.18)



The drilling and production systems segment includes businesses that provide systems and equipment used to control pressures and direct flows of oil and gas wells. The products are employed in diverse operating environments, including basic onshore fields, complex onshore and offshore environments, deep water subsea applications, and high temperature geothermal operations.

The valves and measurement segment includes businesses that provide valves and measurement systems primarily used to control, direct and measure the flow of oil and gas as they are moved from individual wellheads through flow lines, gathering lines and transmission systems to refineries, petrochemical plants, and industrial centers for processing. Products include gate valves, ball valves, butterfly valves, Orbit valves, double block and bleed valves,

Value Creation by Oilfield Service Companies

plug valves, globe valves, check valves, actuators, chokes, and aftermarket parts and services, as well as measurement products, such as totalizers, turbine meters, flow computers, chart recorders, ultrasonic flow meters, and sampling systems.

The process and compression systems division includes businesses that provide standard and custom-engineered process packages for separation and treatment of impurities within oil and gas and compression equipment and aftermarket parts and services to the oil, gas, and process industries. Integrally geared centrifugal compressors are used by customers worldwide in various industries, including air separation, petrochemical, chemical, and process gas. Products include oil and gas separation equipment, heaters, dehydration and desalting units, gas conditioning units, membrane separation systems, water processing systems, integral engine-compressors, separable reciprocating compressors, two and four-stroke cycle gas engines, turbochargers, integrally-gear centrifugal compressors, compressor systems, and controls. Aftermarket services include spare parts, technical services, repairs, overhauls, and upgrades.

Cameron International Corporations has been very active in the mergers and acquisitions arena in the past ten years both as a seller and buyer, though their buying activities are much more dominant.

Cameron has a solid Board with good representation from the upstream and OFS industries for a score of 2.3/3.0.

Cameron enterprise value is consistent with calculated intrinsic value at a lower than historical growth rate for the surface equipment segment.

National Oilwell Varco (NYSE NOV) can trace its roots all the way back to the Brissonneau Brothers in 1841. From the Brissonneau Brothers came two major predecessors, Oilwell Supply and National Supply which were founded in 1862 and 1893. These two companies manufactured and distributed pumps and oil derricks. Its modern shape began to emerge after Pete Miller became CEO in 2001 with an aggressive but focussed series of acquisitions in the 2000s:

2004:

- Varco International Inc. agrees to merge with National Oilwell, with National Oilwell continuing as the surviving corporation.
- Developed first non-bypass fully pressure balanced drilling motor
- Spent \$2.8 million acquiring assets or companies, with the largest being a distribution operation in Australia

2005:

- Name change to National Oilwell Varco (NOV)
- Acquires minority interest in Comprehensive Power Inc., a rig technology company

Value Creation by Oilfield Service Companies

- Acquires Varco International Inc.
- Acquires DrillLogic, LLC
- Acquires Hebei Huayouyiji-Tuboscope Coating Co, Ltd / Joint venture
- Acquires Threading Business of Turner FLP Holdings, LTD
- Acquires WellTronics, LP
- Acquires Smart Screen Systems, Inc.
- Acquires Oilfield Techno Equipment, Ltd.
- Acquires Roil Trade s.r.o

2006:

- IntelliServ a subsidiary, commercialized the first wired drill pipe
- Retsco a subsidiary, introduced the Titan BX Relief Valve for “fail open pneumatically actuated operation
- Grant Prideco a subsidiary, developed rotary-shouldered connection with double-start threads
- Acquires 87% of the outstanding shares of NQL Energy Services Inc.

2007:

- Acquires Gammaloy Holdings, L.P.
- Acquires Molde Produksjonscenter AS
- Acquires Moineaus S.A.I.C.
- Acquires Hiram Industries, Inc.
- Acquires Sampwell Testing Services, Ltd./New Era Machining, Ltd.
- Acquires CTES, LP
- Acquires Sara Services and Engineers Pvt. Ltd.
- Acquires Kreiter Geartech

2008:

- Acquires Die Company, Inc.
- Acquires Welch Power Source, LLC
- Acquires Hendershot Tool Company
- Acquires Grant Prideco Inc.
- Acquires NOV Fabtech
- Acquires CKS
- Acquires Bear Pump & Equipment Ltd.
- Acquires Kem-Tron Technologies Inc.
- Acquires Sakhalin Outfitters LLC
- Acquires Mid-South Machine Inc.

2009:

Value Creation by Oilfield Service Companies

- Acquires ASEP Group Holding B.V.
- Acquires ANS (1001) Ltd.
- Acquires Spirit Drilling Fluids Ltd.
- Acquires Spirit Minerals L.P.
- Acquires Rincon de los Sauces Inspection Operation
- Acquires Western Thunderhorse
- Acquires South Seas Inspection
- Acquires Hochang Machinery Industries Co.
- Acquires Stork MSW
- NOV Hydra Rig designed the coiled tubing control system for complete well site control and monitoring called Merlin

2010:

- Acquires Ambar Lone Star Fluid Services, LLC
- Acquires Visible Assets Inc.
- Acquires Sigma Offshore Ltd.
- Acquires Paradigm Lift Technologies LLC
- Acquires kVA Ltd.
- Acquires Power & Leasing division of Tarpon Energy Services, Ltd.
- Acquires Group KZ, LLP
- Acquires Big Red Tubulars, Ltd.
- Acquires Advanced Production and Loading PLC
- Acquires Greystone Technologies PTY Ltd.
- Acquires Welltronics MWD LLC
- Acquires Permian Fabrication

2011:

- Acquires Christensen Roder Productos E Servicios De Petroleo Ltda.
- Acquires Capital Valves Limited
- Acquires Merpro Group Limited
- Acquires Conner Steel Products Holding Company
- Acquires Barracuda Ventures Pte Ltd
- Acquires Khalil Al Sayegh General Maintenance Company
- Acquires Ameron International Corporation
- Acquires Scomi Oiltools, Inc.
- Acquires Scomi Oiltools De Mexico
- Acquires XL Hardbanding & Fabrication Inc.

2012:

- Acquires TechDrill LTD/Forth Valley Engineering LTD

Value Creation by Oilfield Service Companies

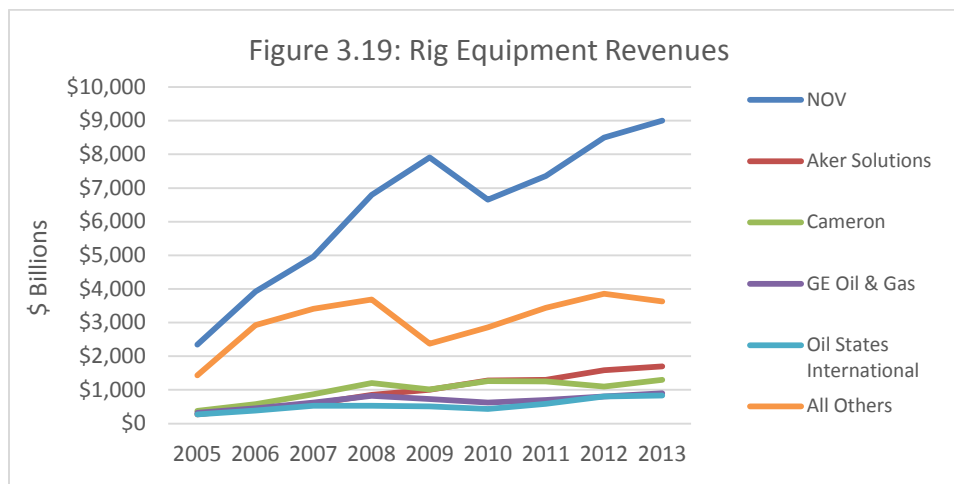
- Acquires Wyoming Pipe and Tool Corporation
- Acquires Interval LLC
- Acquires NKT Flexibles I/S
- Acquires Spectral, Inc.
- Acquires Enerflow Industries, Inc.
- Acquires Wilson Distribution
- Acquires Zap-Lok Pipeline Systems, Inc.
- Acquires Engco Sales Ltd
- Acquires CE Franklin LTD
- Acquires DynaWinch Industries Ltd
- Acquires Petrex, Inc.
- Acquires Fiberspar Corporation
- Acquires Algoa Oil & Pipeline Services LTD
- Acquires Algoa International Anstalt/Algoa International Angola Anstalt
- Acquires GH Services, LLC
- Acquires Westpro Fluid Handling Systems
- Clay C. Williams new Company President and Chief Operating Officer

2013:

- Acquires Robbins & Myers. Acquisition completed in February.
- Acquires Fidmash
- Acquires Novmash
- Acquires Itasco Precision Ltd.
- Acquires BBJ Tools Inc.
- Acquires Moyno de Mexico S.A. de C.V.
- September 24, 2013 – NOV announced that its Board authorized Company management to move forward with exploration of a plan to spin-off the Company's distribution business from the remainder of the company, creating two stand-alone, publicly traded corporations.

National Oilwell Varco operates in three different segments; Rig Technology, Petroleum Services and Supplies, and Distribution Services. NOV claimed \$22,869 million in Revenues for the year ended December 31, 2013 and the Rig Technology segment accounted for just over 50%, the Petroleum Services & Supplies segment 30% and Distribution Services 20%. NOV is the stand-out leader of the Rig Equipment segment with more than a 50% market share (Figure 3.19)

Value Creation by Oilfield Service Companies



The Rig Technology segment includes design, manufacturing, selling, and servicing systems for drilling, completion, and services of gas and oil wells. National Oilwell Varco manufactures and has patents for many highly-engineered components that are vital to modern drilling rig performance.

The Petroleum Services and Supplies is NOV's next highest source of revenue. They maintain, rent, and sell products necessary to perform drilling operations. For example; drill bits, pipes, transfer pumps, motors, and other important components.

The last segment, Distribution Services deals with maintenance, repair and operating supplies. This segment includes everything from repairing a major drilling pipe to delivering spare parts to drilling operations worldwide and is being spun-off to NOV shareholders as a separate company.

National Oilwell Varco has established itself within the equipment sector of the oil and gas industries as a company that grows by acquisitions. NOV paid nearly \$2,397 million net of cash for acquisitions in 2013 alone. CEO Miller gave many interviews explaining NOV's aggressive acquisition strategy and how it is the driving factor behind the company's growth. Warren Buffet has shown interest in the NOV business model and has purchased 8.8 million shares. Miller was succeeded by Clay Williams as NOV CEO in 2013, but will continue as CEO of the Distribution Services spin-off.

NOV has a solid Board with representatives from OFS, upstream and related industries for a score of 2.4/3.0.

With over 50% of the drilling equipment market, NOV cannot sustain its historical growth rate. Indeed our findings on this sector is that return on assets is a more powerful driver than revenue growth. This would suggest a strategy of developing and marketing distinctive

Value Creation by Oilfield Service Companies

products that can further improve drilling productivity and improving internal efficiency in order to raise returns, rather than continuing a growth by acquisition strategy.

NOV enterprise value is well explained by calculated intrinsic value assuming a lower than historical growth rate for the rig equipment segment.

Dril-Quip (NYSE DRQ) is a relative newcomer to the OFS industry: the company was co-founded in 1981 by Larry E. Reimert, Gary D. Smith, J. Mike Walker and an investor. The Company was reincorporated as a Delaware corporation on August 12, 1997 and completed a successful initial public stock offering in October of 1997.

- 1982 Specialty connectors introduced
- 1983 Aberdeen presence established; MS-15 mudline suspension system introduced
- 1984 Dril-Quip template systems introduced
- 1986 Dril-Quip Holland established; subsea wellheads introduced
- 1990 Subsea tie-back systems introduced; Dril-Quip Asia established
- 1991 Dril-Quip Norway established; Diverters, TLP and Spar subsea wellhead systems and wellhead connectors and subsea production trees introduced
- 1992 Gate valves introduced
- 1993 Platform wellheads and trees introduced
- 1994 Presence established in Denmark and Perth, Australia
- 1997 Successful IPO; Marine drilling risers and surface wellheads and trees introduced
- 2000 Dril-Quip do Brazil established
- 2001 Production control systems introduced; Dril-Quip Nigeria established
- 2002 Liner Hangers and Production Risers Systems Introduced
- 2003 Added to Standard & Poor's 600 Oil & Gas Equipment & Services Index
- 2005 Manifold System and Flowline Connection Systems Introduced; DRQ added to Russell 2000 Index
- 2006 Dril-Quip Egypt Cairo Established
- 2007 Credit Line with Guaranty Bank reduced from \$65mm to \$10mm; agree to sell 3 million shares of common stock; Series A Preferred Stock eliminated

Value Creation by Oilfield Service Companies

2008	HIPPS manifold introduced; Series A Preferred Stock, 500,000 shares issued; Share buyback of \$100 million
2009	Credit Line with Guaranty Bank ended
2010	Dril-Quip provided a wellhead and other equipment involved in “Deepwater Horizon” accident in the Gulf of Mexico; DRQ added to Standard & Poor’s Midcap 400 Index; Dril-Quip Egypt Alexandria Established
2011	Effective January 20, 2011 Larry Reimbert, the former Co-Chairman of the Board and Director stepped down and agreed to work as an Independent Consultant; new Singapore manufacturing facility construction completed; \$16.1 million paid in Brazilian tax dispute
2012	Dril-Quip dismissed from lawsuit over product failure, wellhead, in “Deepwater Horizon” accident

The company is headquartered in Houston, TX, which oversees western hemisphere activity and overall corporate operations, and two additional regional headquarters in Aberdeen, Scotland, which oversees European and African operations, and Singapore, which oversees eastern hemisphere operations including the Pacific Rim, Southeast Asia, Australia, India, and the Middle East, producing 74% of 2012’s revenues from foreign markets. The company operates in two revenue lines consisting of products, offshore drilling and production equipment, and services from technical advice with relation to company products, that produced \$733 million in revenue for the year ended 2012. Subsea Equipment is the leading segment used for our standard model cash flow projections (Figure 3.15 above).

Dril-Quip, Inc.’s designs, manufactures, fabricates, inspects, assembles, tests and markets subsea equipment, surface equipment and offshore rig equipment, which cumulatively account for 83% of revenues in 2012 and are created to sustain deepwater, harsh environment, and severe service applications. This equipment is used for exploration and development of oil and gas from offshore drilling rigs, including, floating rigs, jack-up rigs, as well as drilling and production of oil and gas well on offshore platforms, tension leg platforms(TLP’s), Spars, floating cylindrical structures buoyed in place, and moored vessels such as floating production, storage and offloading monohull moored vessels.

From their subsea equipment product line, Dril-Quip manufactures and sells subsea wellheads, mud line hanger systems, specialty connectors and associate pipe, subsea production trees, production riser systems, liner hangers, subsea control systems, and subsea manifolds. This equipment is used for drilling and production of offshore oil and gas wells to be used underwater.

Dril-Quip, Inc.’s surface equipment consists of platform wellheads and platform production tree’s which have been created from technology used for similar subsea applications, but have

Value Creation by Oilfield Service Companies

been adjusted for use above water. This surface equipment is used on production platforms, tension leg platforms and spars for flow control.

The offshore rig equipment of their products line includes a drilling riser system, wellhead connectors and diverter. This equipment is used to compensate for the vertical motion of the rig relative to the ocean floor, as a remote connection and disconnection of the drilling riser system to and from the blowout preventer stack, as remote connections to and from the blowout preventer stack, production tree or production riser and the wellhead, and to protect from shallow gas blowouts and to divert gases off of the rig during drilling.

Dril-Quip Inc.'s services line offers technical advice, the reconditioning of its customer owned products, as well as the rental of running tools for installation and retrieval of Dril-Quip products. This line of business in 2012 represented nearly 17% of revenues which has increased over the last 3 years.

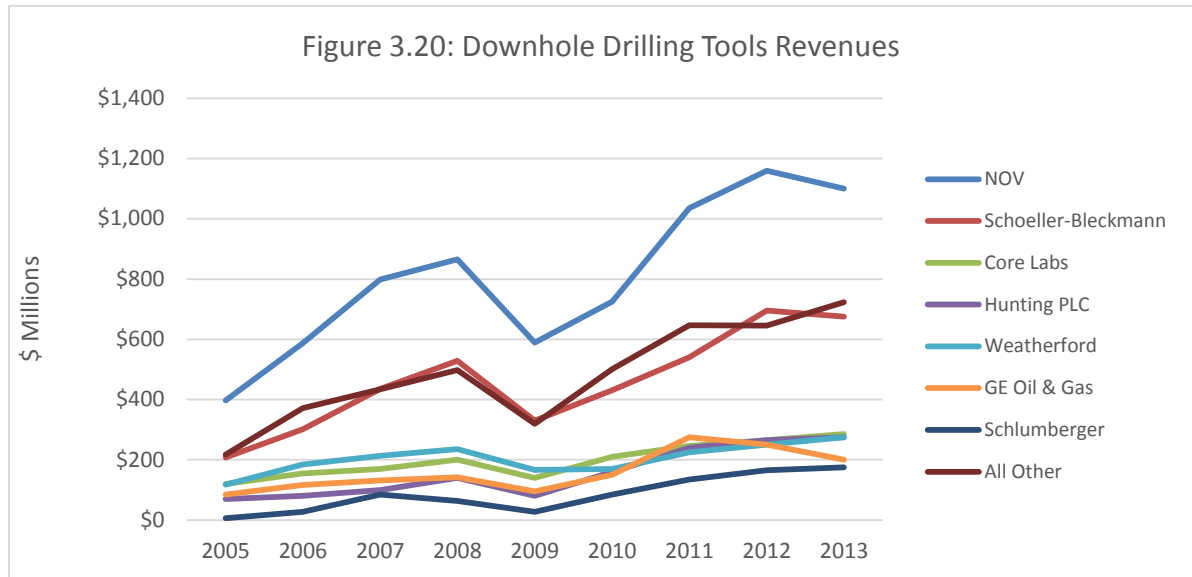
The company has grown organically rather than by acquisition, primarily in the subsea equipment segment, at 21.4% pa from 2005-2013 compared with a subsea equipment growth rate of 18.5% pa and has maintained a high EBITDA return on assets. This strategy of focus on offshore equipment and capital discipline has proven to be a winning recipe for growth in shareholder value. The company is still small compared to segment leaders. It is #7 in market share of total offshore equipment segment revenues (Figure 3.15) and has the potential to continue its profitable growth.

Dril-Quip has a small but strong Board with upstream and OFS experience, giving a score of 2.6/3.0.

Dril-Quip's enterprise value represents a 78.6% premium over calculated intrinsic value, expressing optimism that the company can capture market share from FMC. As a small company, there is room for growth, but an enterprise value that is one third of FMC's compared to an intrinsic value of one seventh FTI seems to be stretching value realities.

Schoeller Bleckmann Oilfield Equipment (ATX Vienna SBO) is an Austria-based holding company engaged in the industrial manufacturing of components and parts for the oil and gas industry, mostly in directional drilling segments, and provides services in these areas. It is the #2 company behind NOV in the Downhole Drilling Tools Segment (Figure 3.20).

Value Creation by Oilfield Service Companies



- 1862 Alexander Schoeller bought the first hammer mill (Theresienhütte)
- 1924 Schoeller and Bleckmann merge into Schoeller-Bleckmann AG
- 1946 Nationalization after WW II
- 1948 Start of deep drilling technology at Ternitz
- 1975 Merger into Vereinigte Edelstahl Werke (Steirische Gusstahlwerke AG Judenburg, Böhler-Werke, Schoeller-Bleckmann Stahlwerke AG) for economic reasons
- 1975 Approximate headcount: 4242
- 1986 Shutdown of steel production in the early 1980's
- 1988 Break-up of Vereinigte Edelstahl Werke
- 1995 Privatization of Schoeller-Bleckmann Oilfield Equipment AG
- 1997 Initial public offering at Brussels
- 1998 Acquired Knust. It provides precision production machining services in the United States and internationally. The company provides CNC turning and CNC milling to oil and gas, geophysical/seismic, medical, power generation, semiconductor, and aerospace industries. It offers engineering, CNC wire, plunge EDM, laser powder-coating, heli-arc, turning, welding, gundrilling, and overlay hard-facing services.
- 1998 Acquired Techman Engineering Limited. It manufactures oilfield products and machine tools for various engineering markets. Its machining operation services include CNC milling that includes CNC horizontal and vertical machining; CNC finish turning that

Value Creation by Oilfield Service Companies

consist of CNC vertical turning; conventional machining, including horizontal boring, milling/drilling, and turning; and other services that consists bonded storage services.

- 1999 Acquired Godwin Machine Works, Katy, TX. It designs and manufactures precision machinery to customers in energy, aerospace, medical, and commercial industries. It specializes in turnkey electro-mechanical products; high precision and close tolerance work; and injection molds for plastic and rubber products.
- 2001 Acquired Darron Tool & Engineering (Sheffield) Limited. It provides engineering services and drilling tools to the oilfield sector worldwide. The company also offers precision manufacturing services, such as inspection, electrical discharge machining/ electrochemical machining, hardfacing, milling, mill/turn, gun-drilling, CNC turning, honing, and deep hole boring services. Its drilling tools include blade stabilizers, sealed bearing roller reamers, large range hole openers, hardfacing systems, single stage hole openers, stabilizer mandrels, standard stabilizer sleeves, and circulating sub systems.
- 2003 Listing on the Vienna stock exchange
- 2005 Capital increase and majority of shares held as free float
- 2010 Acquires 100 % of Drilling Systems International Ltd. (DSI). Headquartered in Dubai. It delivers specialized downhole circulation tools which steer the flow direction of drilling muds in the drill string. The company's flagship product is the PBL tool, which forms part of the drill string. The PBL tool delivers value to customers through considerable time and cost savings, as the system is highly reliable and easy to operate.
- 2012 Acquired an interest in D-TECH (UK), a start-up downhole tools provider.
- 2013 Schoeller-Bleckmann Oilfield Equipment AG (WBAG:SBO)'s Equity Buyback Plan announced on April 25, 2012 (the company has repurchased 3,230 shares, representing 0.02% for €0.83 million. With this, the company has completed the repurchase of 3,230 shares, representing 0.02% for €0.83 million under the buyback announced on April 25, 2012.)

The Company's activities are structured in two segments mainly supporting directional drilling:

1. High-precision components

For applications in the MWD/LWD (Measurement and Logging While Drilling) technology sector, collars and internals made of special alloyed steel and other nonmagnetic metals are required. These collars and internals are used to mount antennas, sensors, batteries, generators and other kind of electronic parts, for making measurements and analyses during the drill operation. All those components need high dimensional accuracy in intricate machining.

2. Oilfield supplies and services

- Non-Magnetic Drill Collars (NMDC), steel bars which are used to prevent magnetic interference during MWD operations.
- Drilling motors, which drive the bit for directional drilling operations.
- Circulation tools steer the flow direction of drilling muds in the drill string.
- Various other tools for the oilfield such as stabilizers, reamers, hole openers, drilling jars and shock tools.

SBO is the only provider worldwide that is engaged both in the development of high-strength non-magnetic steels for the oilfield service industry and in metallurgical treatment and manufacture of high-precision components for directional drilling. At Godwin, the first-ever digital laser copying machine to be used in the oilfield service industry went on stream. This system offers SBO's customers new and efficient solutions for small-series production of complex products. Development work for a new Exoko-drilling motor technology continued in 2012.

SBO has made selective acquisitions to strengthen its ability to deliver distinctive specialty products and services supporting directional drilling. This strategy has allowed the company to grow revenues from 2005-13 at 18.0% compared to the overall downhole drilling tool segment growth rate of 14.9% pa while producing EBITDA/ Total Assets returns from 2005-2013 averaging above 20% and has enabled superior growth in shareholder value.

SBO's governance structure consists of a two person Executive Board supported by a five person Advisory Board. CEO Grohman has been with SBO since 2001 and has a broad industry background; he is supported by Ing. Gritsch who has been with SBO since 1994. The Advisory Board has three members with energy industry experience and two with unspecified affiliations. Although this structure has worked well for SBO, it is not clear whether the Advisory Board has the experience and stature necessary to challenge the executive team on their international OFS strategy and operations practices.

SBO enterprise value is well explained by calculated intrinsic value.

Oceaneering International, Inc. (NYSE: OII) was founded in 1964 and originally operated as a Gulf of Mexico diving business. After it combined its operations with two other diving companies, Oceaneering was incorporated in 1969. Most of the company's work during the first four decades was engaged in inspecting the legs of oil rigs in the Gulf of Mexico. After supporting a considerable amount of research into safety techniques for their divers in the early 1970s, Oceaneering purchased the rights to the JIM suit in 1975.

Oceaneering's original headquarters were in Santa Barbara, California, but were then relocated to Houston, Texas in March 1980. Along with relocating its headquarters, Oceaneering also completed numerous acquisitions in the 1980s. Marinav Corporation, a Canadian offshore surveying company, was acquired in 1982 for \$3 million. In 1983,

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Oceaneering acquired Steadfast Marine, Inc., which was a marine search firm employed by the U.S. Navy. In the late 1980s, Oceaneering was the Navy's global contractor for marine searches, and the company developed a reputation as the best in this field. Oceaneering trained divers at its own College of Oceaneering near Los Angeles and purchased the school in 1981 and owned it until 1995. In December 1991, Oceaneering shares transferred from the NASDAQ to the New York Stock Exchange. In August 1992, OII acquired Eastport International Inc., a Maryland-based producer of robotic systems, through a \$10 million stock deal. In 1993 and 1994, Oceaneering acquired the assets of ILC Dover Inc.'s Space Systems division and Multiflex, a leading producer of umbilicals, for the offshore petroleum industry. The company's largest single capital investment was to build a Mobile Offshore Production Systems (MOPS) division off the coast of Western Australia for \$90 million.

After investing to develop its Remotely Operated Vehicles (ROV) business, Oceaneering dominated the ROV market with 30 percent share by 2002. With such a significant market share, OII acquired 44 ROVs and other assets from Stolt Offshore S.A. for \$48.4 million in early 2004. These ROVs were based in Western Africa, Brazil, and Norway. In March 2008, Oceaneering acquired GTO Subsea AS (GTO), a Norwegian rental provider of specialized subsea dredging and excavation equipment to the oil and gas industry, for \$40 million. The company's primary interest in acquiring GTO was to expand its ROV tooling suite. The investment in acquisitions in 2011 of \$292 million was three times what was spent in total on acquisitions during the 2006 through 2010 period. In December 2011, the company acquired AGR Field Operations Holdings AS for \$220 million to significantly increase its Asset Integrity business. With much of the company's success in the expansion of the ROV segment, Oceaneering has grown to a diversified, advanced applied subsea technology organization operating around the world.

Oceaneering International, Inc. provides global oilfield engineering services and products, primarily to the offshore oil and gas industry, with a specific focus on deepwater applications. Through its developed technology expertise, the company also serves the defense, entertainment, and aerospace industries. The company offers several products and services which include remotely operated vehicles (ROVs), built-to-order specialty subsea hardware, deepwater intervention and manned diving services, non-destructive testing and inspection, and engineering and project management. Oceaneering's lead segment used in our standard model projections is Subsea Equipment (Figure 3.15 above). With its worldwide operations, Oceaneering has achieved its growth by executing a plan of both internal research and development augmented by strategic acquisitions.

With a focus on deepwater applications, Oceaneering is a global provider of engineered services and products, mainly to the oil and gas industry. The company's operations are split between the Oilfield and Advanced Technologies businesses. Within the Oilfield business, there are several segments which consist of Remotely Operated Vehicles ("ROVs") accounting

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for 30% of total 2013 corporate revenues, Subsea Products (also 30% of revenues), Subsea Projects (15% of revenues), and Asset Integrity (15% of revenues).

The ROV segment provides submersible vehicles operated from the surface to support offshore oil and gas exploration, development and production activities. The Subsea Products segment supplies a variety of specialty subsea hardware, and the Subsea Projects segment provides multiservice vessels, oilfield diving and support vessel operations, which are usually used in inspection, maintenance and repair and installation activities, and a mobile offshore production system. The Asset Integrity business segment provides asset integrity management and assessment services and nondestructive testing and inspection.

The Advanced Technologies business (10% of revenues) provides project management, engineering services and equipment for application in non-oilfield markets.

A significant portion of Oceaneering's revenue in 2013 is attributable to operations in foreign countries. These foreign operations accounted for approximately 66% of OII's consolidated revenue in 2013. Oceaneering's operations are also divided into several geographic segments. These geographic segments include United States, Africa, Norway, United Kingdom, Asia and Australia, Brazil, and other foreign territories.

Oceaneering intends to continue its strategy of acquiring, as opportunities arise, additional assets or businesses, to improve its market position or expand into related service and product lines. Although the company is #6 in share of total revenues in the offshore construction services segment (Figure 3.15), Oceaneering is the world's leader and largest owner/operator of work-class ROVs employed in oil and gas related operations. At December 31, 2013, OII owned 304 work-class ROVs, and they estimate that their products represent approximately 35% of the work-class ROVs utilized in the oilfield service industry. OII anticipates ROV operating income to increase in 2014 as a result of an increase in days on hire and they plan to continue adding ROVs at levels they determine appropriate to meet market opportunities. They anticipate adding 30 to 35 vehicles in 2014 and expect to retire, on average, 4% to 5% of the ROV fleet on an annual basis.

Oceaneering has a weak Board with limited relevant experience for a score of 1.6/ 3.0.

Oceaneering enterprise value at 12/31/2013 showed a 21.5% premium over calculated intrinsic value. Investors are apparently confident that Oceaneering can surpass its stellar past performance and possibly that growth in demand for ROVs will exceed that of the overall subsea equipment segment.

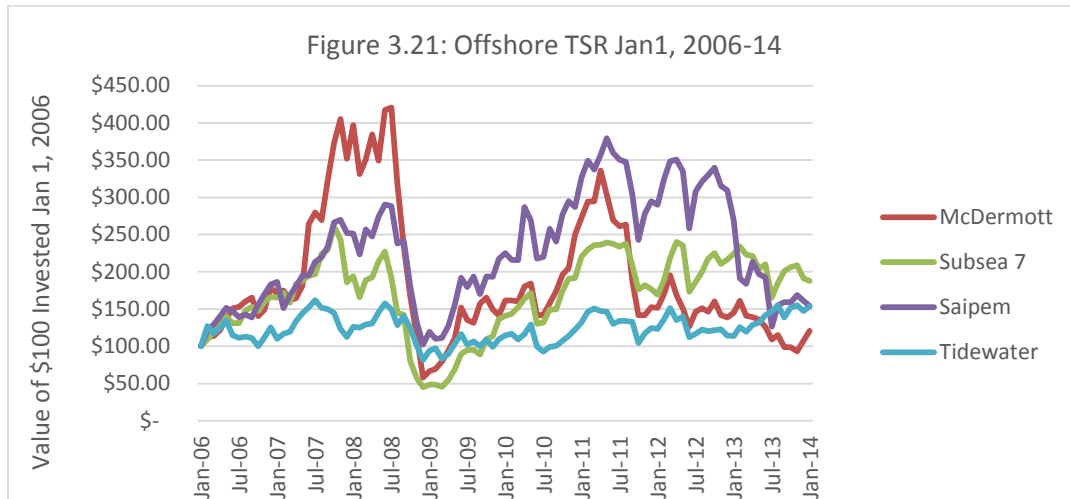
3.4 Offshore

In the Offshore sub-sector the five companies studied (amended to four following placement of Oceaneering in the Equipment Group) in order of TSR performance from end 2005 to end 2013 were:

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- Subsea 7 (SUBC)
- Saipem (SPM)
- Tidewater (TDW)
- McDermott (MDR)

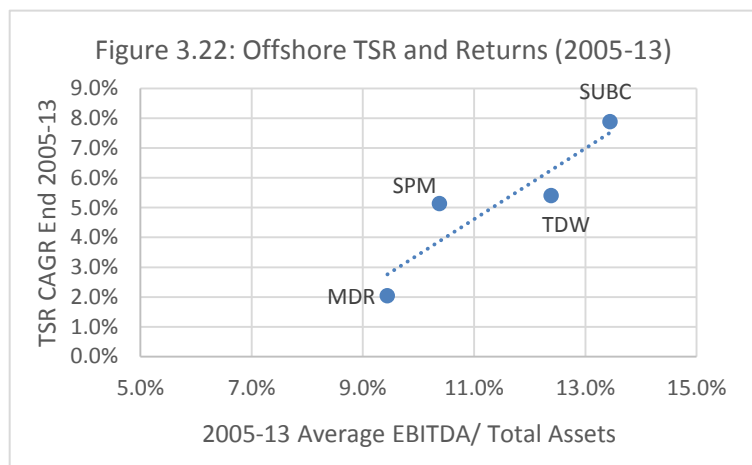
Since the recession of 2009, this Sub-sector TSR recovered but then declined again following the Macondo tragedy (Figure 3.21), which suppressed project development work in the Gulf of Mexico, as well as internal disarray in Saipem and McDermott.



McDermott shareholder value has declined particularly sharply. Saipem has followed more recently following bribery allegations. Even the best performer, Subsea 7, achieved only a moderate increase in shareholder value.

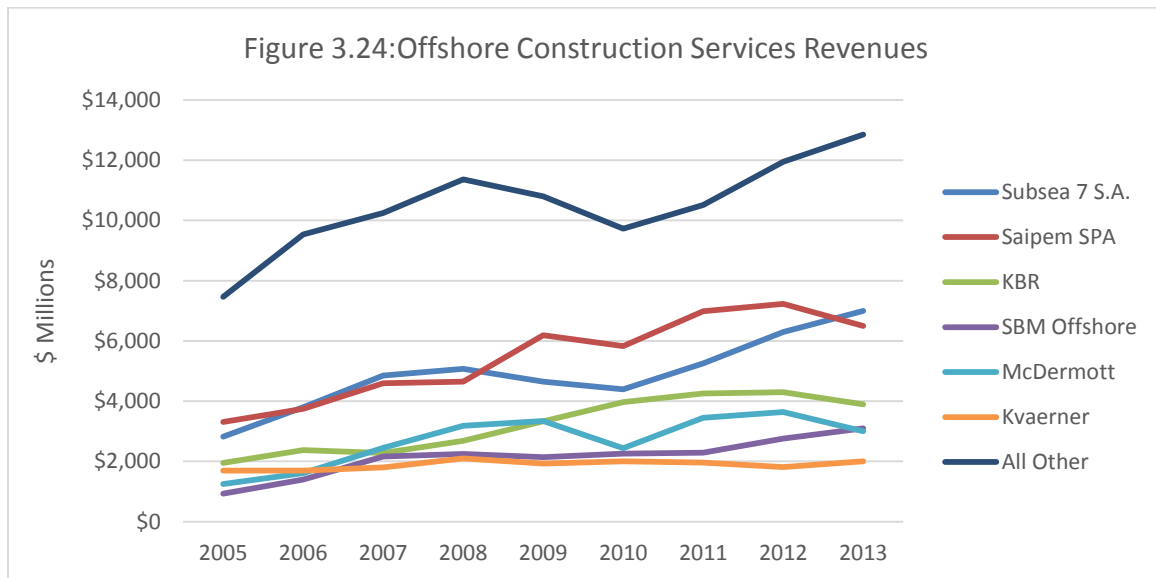
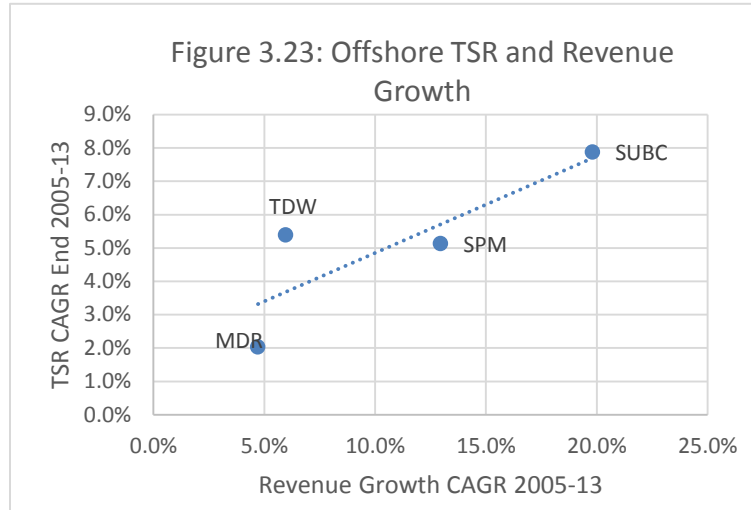
TSR in this Subsector has been driven both by EBITDA/ Total Assets returns (Figure 3.22) and by revenue growth (Figure 3.23). Subsea 7 has achieved higher returns by concentrating on delivering offshore construction services depending on highly specialized marine equipment, often developed as a result of its strong competitive position in the North Sea. McDermott and Saipem have broader, less distinctive positioning and have encountered headwinds recently.

Tidewater is focused on supply vessels supporting construction and operations.



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Subsea 7 and Saipem are the market share leaders, but Offshore Construction Services is a segment characterized by a large number of companies competing vigorously for business. These companies (All Other in Figure 3.24) have been taking market share from Saipem, McDermott and KBR.

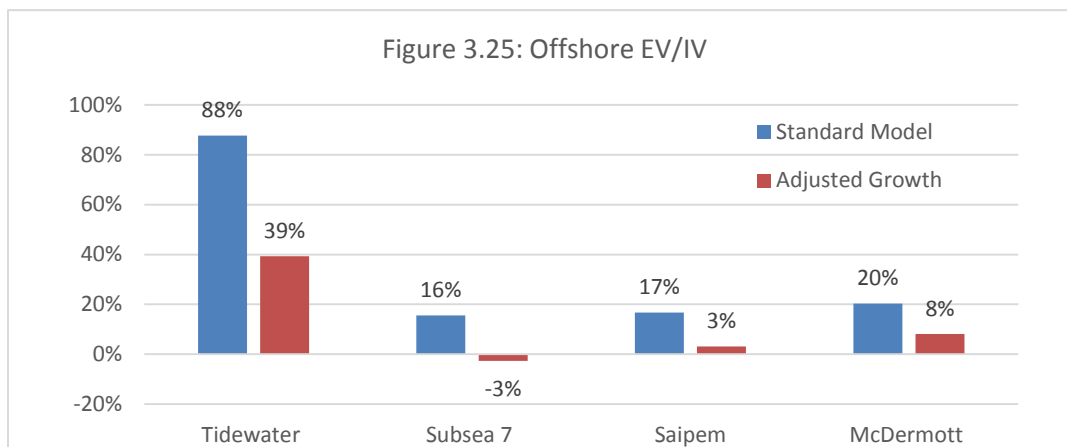


Our standard cash flow model estimates intrinsic value for the sub-sector below enterprise value (Figure 3.25) implying that the market is using slightly more optimistic assumptions on the future of SPM, SUBC and MDR than those included in our standard model and seems much more optimistic about Tidewater.

The critical assumptions are the revenue growth rate that the sub-sector will realize and the relationship between capital expenditures and cash flow. The growth rate for offshore construction services (the lead segment for Saipem, Subsea 7 and McDermott) from 2010-13 was 7.8% pa and our standard model assumes this will be sustained in the future. As for offshore drilling, we have adjusted this upwards (to 9.5% p.a.) to reflect abnormally low activity immediately following the Macondo tragedy. We have adjusted the revenue growth for supply vessels from the 2010-13 level of 7.7% p.a. to 11% p.a. reflecting fleet modernization as well as increased activity. In recent years TDW, SUBC, SPM and MDR have been spending more on new marine vessels and delivery systems than they have generated in

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cash flow. To achieve a positive cash flow, our standard model assumes capex will decrease to 60% of cash flow.



The increase in segment revenue growth rate aligns intrinsic value with enterprise value for the three offshore construction firms. Tidewater, however, appears overvalued by the market.

Offshore Company Reviews

Subsea 7 (Oslo: SUBC) Subsea 7 S.A. was created through a merger between Acergy S.A. and Subsea 7, Inc.

Acergy S.A. started as Stolt-Nielsen Seaway A/S in the 1970's to provide diving services for offshore exploration in the North Sea. In 1992, Comex Services S.A. and Stolt-Nielsen Seaway A/S are bought by Stolt-Neilsen S.A. (SNSA) in separate transactions. In the 1990's, the company, now named Stolt Comex Seaway, focused on flexible and rigid flow-line markets, performing the engineering, procurement, installation, and commissioning services. The company acquired Ceanic in 1998, expanding its presence in the Gulf of Mexico, and French sub-sea contractor E.T.P.M. in 1999. A year later, the company became Stolt Offshore as it began to have operating losses due to poor management of some projects. In an effort to re-define the focus of the company onto a tighter segment of the offshore market, a new senior management team joined the company in 2003. Two years later, Stolt-Nielsen sold its ownership in Stolt Offshore and its equity interest in Stolt Comex Seaway, which together formed Stolt Offshore S.A and was floated on Oslo Stock Exchange and NASDAQ. In 2006, Stolt Offshore S.A. changed its name to 'Acergy S.A'.

Subsea 7 Inc. dates back to 1854 when Det Søndenfjelds-Norske Dampskipselskap (DSND) began as a shipping company with a focus on passenger transportation. DSND limited its activity level between 1964 and 1985 after closing down its passenger liner service between Hamburg and Oslo. In 1985, DSND made many investments, mostly in offshore-related activities. The company diversified after acquiring six special offshore vessels by 1995, two in offshore construction, two in well maintenance, and two in geo-technical drilling. In 2002, DSND and Halliburton Subsea formed Subsea 7 Holding, Inc. in a 50/50 joint venture. Three

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years later, DSND acquired Halliburton's 50% share of the company and floated Subsea 7, Inc. on to the Oslo Stock Exchange.

Acergy and Subsea 7 merged on January 7, 2011. .. As a compromise, the new company kept the Acergy Luxembourg trading address and operational headquarters in London while taking the 'Subsea 7' name.

Subsea 7 S.A. concentrates on providing services and project management expertise to clients in the offshore energy industry, engaging in the design and installation of deep-water oilfield infrastructure. To structure its operations, Subsea 7 S.A. divided its operations into four territories: North Sea and Canada (40% of 2013 revenues); Africa, Gulf of Mexico, and Mediterranean (40% of revenues); Asia Pacific and Middle East (8% of revenues); and Brazil (13% of revenues).

The company operates in 6 market segments. Four core segments have the goal to achieve sustainable returns with manageable levels of risk:

1. Subsea Umbilicals, Risers, Flowlines (also known as SURF)
2. Life-of-Field (also known as LOF)
3. Conventional, and
4. Hook-up

Two complementary market segments seek opportunities where the company can utilize its expertise and assets

1. Remotely Operated Vehicles (also known as ROVs) and Intervention support (i-Tech division)
2. Renewables, Heavy Lifting, and Decommissioning.

The SURF segment is Subsea 7's primary business and accounts for 73% of revenues.

Subsea 7 Vision (from the company website):

"To be acknowledged by our clients, our people, and our shareholders, as the leading strategic partner in seabed-to-surface engineering, construction and services."

Subsea 7 expresses five core values to describe how business must be conducted in order to achieve success. These values are safety, integrity, innovation, performance, and collaboration.

Combined with these five core values are four key strategic elements that provide Subsea 7 S.A. with the focus to choose key opportunities and accomplish the best differentiation for their clients and shareholders. These four elements are people, assets, technology, and local presence. According to the company web site "We differentiate ourselves by delivering high-quality services that are built on our core strengths of engineering, project management,

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supply chain and vessel management, and supported by our commitment to invest in people, technology and assets.”

Subsea 7 values its people and believes the importance of investing in learning and development to allow people to plan and manage sustainable careers with Subsea 7 S.A. Technology adds value to the company and provides solutions to the challenges of operating safely at the limits of seabed-to-surface capability. The company believes in maintaining its fleet capability through continual investment in new vessels, ROVs, and related technology. To respond effectively to local prospects, Subsea 7 S.A. focuses on building a strong local infrastructure, enhancing its position as a valuable global partner.

The North Sea has provided a “laboratory” for Subsea 7’s technology development, leveraging the company’s strong relationship with Statoil. SUBC’s revenues in the region has grown as a result of new technologies, new discoveries, and larger projects. Advanced technologies have allowed for subsea processing of Norwegian continental shelf production and have extended the life of existing fields and infrastructure. One completed project in 2012 was technically complex, involving the installation of rigid pipelines, umbilicals, and flexible flowline jumpers. The project included the successful fabrication and installation of a 25.7 km dual diameter clad pipelines with direct electrical heating, which were Subsea 7 “firsts” for Statoil. The technologies developed offshore Norway are made available for clients in the other regions.

Subsea 7 has a solid Board with good industry experience for a score of 2.0/3.0.

Subsea 7 enterprise value is well explained by calculated intrinsic value.

Saipem (Rome: SPM) Headquartered in Milan, Italy, Saipem S.p.A is an Italian based turnkey contractor serving the energy industry (mainly companies involved in exploration and production of oil and gas assets) primarily through offshore drilling, engineering, and construction. The company originally started as the oilfield service arm for Eni in the 1950’s developing proficiencies in services such as onshore pipelaying, plant construction and drilling. Saipem started performing these services offshore for Eni and other customers (supermajors, majors, major nationals and independents) in the early 60’s, but it was not until 1969 that Saipem became autonomous with the ability to freely provide services to firms outside Eni (such as when they expanded to North Sea operation in 1972). Saipem became a public entity after being listed on the Milan Stock Exchange in 1984 with Eni maintaining a controlling interest and board seats (currently owns approximately 43% of Saipem).

Saipem continued providing their original onshore services along with offshore activities before undertaking a concerted effort in the late 1990’s towards gaining market share in offshore construction services due to the emergence of higher growth/margin markets in deepwater and developing countries. This shift led to the construction of offshore drilling and construction vessels as well as opening numerous fabrication yards worldwide to support their offshore construction business. Saipem also made two major acquisitions in support of this

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effort in Bouygues Offshore in 2002 and Snamprogetti in 2006. In 2012, Saipem's CEO and CFO resigned as part of an investigation into potential bribes to win business from Algeria National Oil Company Sonatrach. A third party investigation was conducted at the request of ENI which to date has not uncovered any wrongdoing committed by Saipem. However, the investigation is still ongoing and the stock price has declined.

Saipem has a global reach, maintaining a strong local presence in strategic areas near major oil and gas E&P plays such as West Africa, North Africa, FSU, Central Asia, Middle East, Canada, South America, and South East Asia. In addition to its strong European base of operations, a major portion of human capital comes from emerging economy countries and other local areas where projects are conducted. With this local content on projects, Saipem's 48,000+ employees represent 126 nationalities.

Saipem has a heavy bias towards remote deepwater projects, but also offers onshore drilling services along with engineering, procurement, project management and construction services on oil and gas industry related projects worldwide. The company is divided into two divisions, Engineering & Construction (EPC/EPCI) and Drilling, with EPC being the larger of the two in both total revenue and market share.

EPC services are provided to exploration and production clients, for both onshore and offshore projects, and include the construction of trunk lines, export pipelines, and infield flow lines, as well as pipe-in-pipe, bundles, tie-in, and riser systems for the transportation of oil, gas, and multi-phase products through water depths. It also develops subsea deepwater fields; provides subsea construction services, such as subsea field development, and remotely operated vehicles and remote intervention systems operations, as well as subsea inspection, maintenance, and repair; and installs offshore structures, including modular deck drilling and production platforms, well-head, and accommodation platforms. In addition, the company is involved in constructing marine terminals, conventional buoy moorings, jetties, and piers. Further, the company provides integrated solutions for large upstream facilities, including oil and gas production, treatment and processing plants, pipeline systems, pumping and compressor stations, and marine terminals; and designs and constructs natural gas liquefaction and regasification facilities, onshore transportation systems, oil refineries, petrochemicals and gas monetization plants, power plants, harbors, and jetties, as well as offers integrated environmental and remediation technologies and services.

In addition, Saipem operates as an offshore/onshore drilling contractor along with owning and operating a fleet of vessels involved in construction, drilling, production storage and offloading, and operating fabrication yards worldwide.

In December 2012, Saipem announced the resignation of CEO Petro Tali in relation to bribery allegations to win work with Algerian NOC, Sonatrach. Algeria provides almost 30% of the natural gas consumption in Italy. The scandal resulted in an immediate loss of \$4 billion in market capitalization. Subsequent financial restatements and earnings guidance warnings

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(spurred by ENI taking a closer look at Saipem in the wake of the bribery scandal) have resulted in Saipem's shareholder value halving between end 2012 and end 2013 (Figure 3.19).

From 2006 through 2013 in pursuit of market share, Saipem incurred capital expenditures running at about 150% of operating cash flow. While revenues grew and EBITDA/ Total assets improved through 2011, in the wake of the scandal the company lost market share, reduced EBITDA/ Total Assets returns, took on debt and warned about possible restatement of earnings resulting in substantial loss of shareholder value.

Saipem has publicized important initiatives designed to improve governance and plans to sustain its current strategy: invest in key assets while leverage technical competencies in engineering and project management coupled with utilization of local content. However, its prospects are clouded by the residue of the scandal and building a stronger governance system, a significant residue of low margin contracts signed during its aggressive growth period and the importance of the South Stream project awarded in 2013. This project, which is designed to transport Russian gas to Europe across the Black Sea bypassing the Ukraine, must now be considered at risk.

The Boards of Saipem and of its major owner ENI have limited oil & gas experience with a score of 1.0/3.0 and the governance system has been shown to be weak. Although numerous initiatives have been announced aimed at strengthening governance, corporate culture can be very resilient to change.

Saipem 12/31/2013 enterprise value is well explained by calculated intrinsic value, but any threat to the South Stream project will certainly put downward pressure on Saipem's value.

McDermott International, Inc. (NYSE: MDR)

Ralph Thomas McDermott established J.Ray McDermott & Company Incorporated at the age of 24 upon an acceptance to build 50 wooden drilling rigs for a wildcatter in Lulling, Texas in 1923 and named the company for his father. The company expanded in 1930's and moved to Houston, Texas where it began providing diverse services to the oil industry and opened an office in New Orleans in 1937. In the 1938 McDermott Inc. introduced the first use of floating drilling equipment in low-lying marshlands of Texas and Louisiana. In 1947, McDermott created the first fixed platform made of steel out of sight of land in 20 feet of water in the Gulf of Mexico for Superior Oil and established a contracting division, which was the major operating segment in the early years. In 1948 it acquire the assets of Harry F. Allsman Company, which provided equipment to meet the new demand for offshore construction. In 1949, the company's oil division was organized as the company commissioned construction of the first vessel (Derrick Barge 4) designed specifically for offshore work.

As the years continued, McDermott Inc. formed a joint venture with company with DeLong engineering Company, which built the first mobile air-jack rig using an elevating device

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patented by DeLong. In 1956, the company established the world's largest offshore fabrication yard near Morgan City, LA. In 1958, the company was listed in the New York Stock Exchange (NYSE), and in 1961 established the company's second fabrication yard and first one outside the United States in Ras-Al-Khafji, Saudi Arabia, of the Saudi-Kuwaiti Neutral Zone.

In 1964, McDermott established its main office in New Orleans (in 2005, it was moved back to Houston). In 1967 the company introduced a new "launch" method aimed to offshore jacket installation due to a trend of jackets becoming too heavy for crane lift. In its place, the jacket was fabricated and transported on its side and launched by slipping it off the barge, counterbalancing it until it turned upright and then guiding it into position. The company expanded in the Gulf of Mexico and the Middle East and installed Egypt's first offshore platforms and largest diameter (18 inches) pipe to date in 240 feet of water for the Gulf of Suez Petroleum Company's El Morgan Field. They established world records for the longest pipe-lay by crossing the Mississippi River twice (5,200 feet), and the largest pipeline - 40 inches in diameter with a 5/8 inch thick concrete coating weighting in at 25 tons per joint.

Pushing beyond product service and geographic limits J.Ray McDermott & Co. Inc. became McDermott incorporated, reflecting a larger more diversified company after what turned out to be an ill-advised acquisition of EPC Company Babcock & Wilcox. In the 1990s MDR led construction and installation for topsides for Shell's Auger Tension Leg Platform (TLP), in the Gulf of Mexico and accomplished multiple records, in addition installing the first drilling and production spar for ChevronTexaco's Genesis project at 2,600ft depth in the Gulf of Mexico.

In 2010, under a transaction with Ocean Stream ASA, McDermott took about 50 to 75% ownership stake in subsea construction vessels, North Ocean 102, and new-build Lay Vessels North Ocean 105 Chartering the Vessels for five years with an option to purchase Ocean-team's share's in both vessel-owning companies. It also spun-off Babcock & Wilcox.

McDermott International, Inc. is a leading engineering, procurement, construction and installation ("EPCI") company focused on designing and executing complex offshore oil and gas projects worldwide. The company is one of the largest U.S.-based engineering and construction ("E&C") companies exclusively focused on the upstream offshore oil and gas sector. Providing fully integrated EPCI services, MDR delivers fixed and floating production facilities, pipeline installations and subsea systems from concept to commissioning. Customers include national, major integrated and other oil and gas companies. Operating in approximately 20 countries across the Atlantic, Middle East and Asia Pacific, MDR's integrated resources include approximately 14,000 employees and a diversified fleet of marine vessels, fabrication facilities and engineering offices.

Activities are supported with comprehensive project management and procurement services. MDR has fully integrated capabilities in both shallow water and deep-water construction and believes it is among the few offshore construction contractors globally capable of providing this wide range of services in many of the larger offshore oil and gas producing regions in the

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world. Contracts are executed through a variety of methods, principally fixed-price, but also including cost reimbursable, cost-plus, day-rate and unit-rate basis or some combination of those methods. The company's business segments consists of Asia Pacific, Atlantic, Caspian and the Middle-East. The subdivision of the Asian Pacific serves the needs of primarily Indonesia, Austria, Vietnam, Malaysia and Thailand. The majority of the companies' projects in this segment are performed on an EPCI basis. Project focus in this segment includes the fabrication and installation of fixed and floating structures and the installation of pipelines and subsea systems.

In 2013, a new CEO, David Dickson, was appointed and he is engineering a turnaround installing a new management team, a new organization including a new Subsea group formed in 2013 to better access opportunities in this robustly growing segment and recapitalization of corporate finances. He is working on improved capital discipline, strengthened commercial bidding processes, better project execution, building a performance-oriented culture and increased business oversight. With a strong backlog, investors are valuing the company on the expectation of improved performance.

McDermott has a very strong Board, several of whom have been appointed in the past year, with experience in OFS and upstream sectors of the oil industry for a score of 2.8/3.0.

McDermott 12/31/2013 enterprise value is well explained by calculated intrinsic value, with a modest 8.0% premium representing a vote of confidence in the new CEO and strengthened Board.

Tidewater (NYSE: TDW)

- 1955** Ten investors build the Ebb Tide, the world's first oil and gas service vessel
- 1956** Tidewater Marine Service, Inc., a public company, commences business in the U.S. Gulf of Mexico.
- 1958** International operations begin in Lake Maracaibo, Venezuela.
- 1966** Tidewater's fleet expands to record numbers—more than 200 vessels at work in the United States, South America, Central America and West Africa.
- 1968** Tidewater acquires Twenty Grand Marine, increasing its fleet to 350 vessels.
- 1969** Tidewater acquires South Coast Gas Compression to create Tidewater Compression Service, Inc.
- 1970** Tidewater (TDW) is listed on the New York and Pacific stock exchanges. Tidewater acquires an interest in oil production in waters off of Indonesia.
- 1971** Tidewater establishes its corporate office in the Tidewater Marine building in New Orleans, Louisiana.

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- 1977** The company changes its name to Tidewater Inc. Tidewater acquires Tidewater Place, a 24-story corporate headquarters building in New Orleans. Tidewater purchases Hilliard Oil & Gas, an oil and gas exploration and production firm.
- 1979** Tidewater adds 26 new vessels to its fleet at a cost of \$37.1 million.
- 1985** Tidewater records its first loss in its 29-year history as the oil and gas industry endures some of the worst times on record. Tidewater sells Hilliard Oil & Gas.
- 1986** Tidewater completes a two-year building program adding 40 vessels to the fleet at a cost of \$104 million.
- 1987** Tidewater records a \$56.7 million loss amid restructuring of its debt with its major lenders. Tidewater sells its Indonesian oil interests.
- 1992** Tidewater consummates a merger with Zapata Gulf Marine, doubling the size of its fleet. Tidewater purchases 19 offshore construction support vessels from McDermott International.
- 1994** Chairman, President and Chief Executive Officer John P. Laborde retires. William C. O'Malley takes over as the company's Chairman, President and CEO. Tidewater Compression expands by acquiring Brazos Gas Compression Corp. and the gas compression subsidiary of energy giant Halliburton.
- 1995** Tidewater restructures its corporate headquarters and field management offices.
- 1996** Tidewater acquires Hornbeck Offshore Services, pushing the company's vessel count to more than 600.
- 1997** Tidewater acquires O.I.L. Ltd., increasing its fleet to more than 700 vessels.
- 2001** Tidewater's new build program is expanded to a \$700 million plan, ensuring that its fleet will be a leading competitor in deepwater markets globally.
- 2002** Dean E. Taylor takes over from William C. O'Malley as Chairman, President and CEO.
- 2008** Tidewater establishes another record for revenue and earnings per share. The company allocates \$310 million for common stock repurchases while investing \$354 million for new vessels, as its fleet upgrade program continues.
- 2009** Tidewater reports its third consecutive year of record revenues and earnings per share, while generating more than \$525 million in cash flow from operations. The company's safety performance reflects only one lost time accident recorded over 40 million man-hours worked, an outstanding performance.

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2012 Jeffrey M. Platt takes over from Dean E. Taylor as President and CEO and joins the Board of Directors. His Tidewater service followed a 15-year career with Schlumberger Well Services and Rollins Environmental Services.

The company's fleet is deployed in the major global offshore oil and gas areas of the world. The principal areas of the company's operations include the U.S. GOM, the Persian/Arabian Gulf, and areas offshore Australia, Brazil, China, Egypt, India, Indonesia, Malaysia, Mexico, Thailand, Trinidad, and West and East Africa. In each of the business segments, the vessels operate in the shallow, intermediate and deepwater offshore markets of the respective regions.

Revenues in each of their segments are derived primarily from vessel time charter contracts that are generally three months to three years in duration as determined by customer requirements, and, to a lesser extent, from time charter contracts on a "spot" basis, which is a short-term agreement (one day to three months) to provide offshore marine services to a customer for a specific short-term job. The base rate of hire for a term contract is generally a fixed rate, though some charter arrangements allow the company to recover specific additional costs.

Tidewater has three major vessel types and vessel statistical information, such as revenue, utilization and average day rates, are declared by vessel class.

Deepwater vessels: This class of equipment is the company's biggest (49%) contributor to consolidated vessel revenue and vessel operating margin. These vessels are generally chartered to customers for use in transporting supplies and equipment from shore bases to deepwater and intermediate water depth offshore drilling rigs, platforms.

Towing-supply and Supply vessels: This is currently the company's largest fleet class by number of vessels and contribute 43% of revenues. The vessels in this class perform the same functions and services as their deepwater vessel class counterparts except they are generally chartered to customers for use in intermediate and shallow waters.

Other Vessels: The Company's "Other Vessels" (8% of revenues) included crewboats, utility vessels and offshore tugs. Crewboats and utility vessels are chartered to customers for use in transporting personnel and supplies from shore bases to offshore drilling rigs, platforms and other installations.

Quality Shipyards, L.L.C., a wholly-owned subsidiary of the company, operated two shipyards in Houma, Louisiana, that construct, upgrade and repair vessels. The shipyards perform repair work and new construction work for third-party customers, as well as the construction, repair and modification of the company's own vessels.

Tidewater revenues in 2013 failed to recover to 2008 levels due to the lingering effects of Macondo. The April 2010 Deepwater Horizon incident negatively affected the level of drilling activity off the continental shelf of the U.S. GOM.

Value Creation by Oilfield Service Companies

From 2007-11, capital spending on new vessels averaged nearly \$2.5 Billion per year, over 150% of operating cash flow. As a result, EBITDA/ Total Assets returns fell from 18% in 2007 to 6% in 2012 and debt rose to over 15% of total capital.

The company continues a vessel construction, acquisition and replacement program, with intent of being able to operate in nearly all major oil and gas producing regions of the world and specifically to add to its capacity to provide vessels to service deepwater exploration, development and production activities. In recent years their focus has been on replacing older vessels in the company's fleet with larger, more technologically sophisticated vessels. Since calendar 2000, the company has purchased and/or constructed 239 vessels at a total cost of approximately \$3.8 billion and at December 31, 2012, has an additional 32 vessels under construction or committed to be purchased for a total cost of approximately \$836.6 million.

There has been some evidence of rising charter rates since 2011, but the combination of weak revenue growth, rising debt and low returns on capital has resulted in sub-par shareholder value creation.

Tidewater has a large eleven member Board, which has considerable relevant experience for a score of 2.7/3.0.

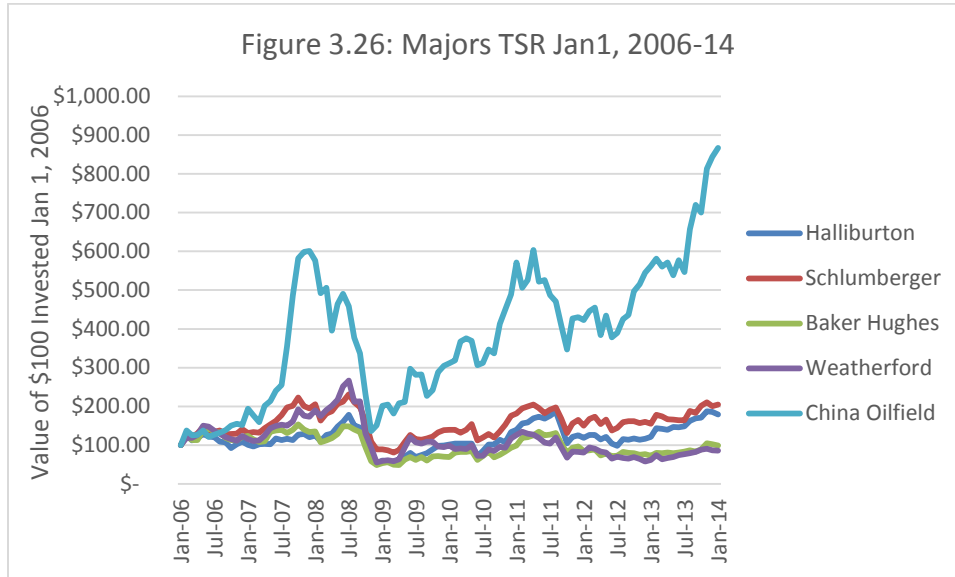
Tidewater enterprise value shows a 39.3% premium over intrinsic value, which suggests a high level of optimism that its vessel modernization strategy will bring sharply higher revenues and justify the high capital expenditures.

3.5 Majors

In the Majors sub-sector the five companies studied in order of TSR performance from end 2005 to end 2013 were:

- China Oilfield Services (China OFS)
- Schlumberger (SLB)
- Halliburton (HAL)
- Baker Hughes (BHI)
- Weatherford (WFT)

Value Creation by Oilfield Service Companies

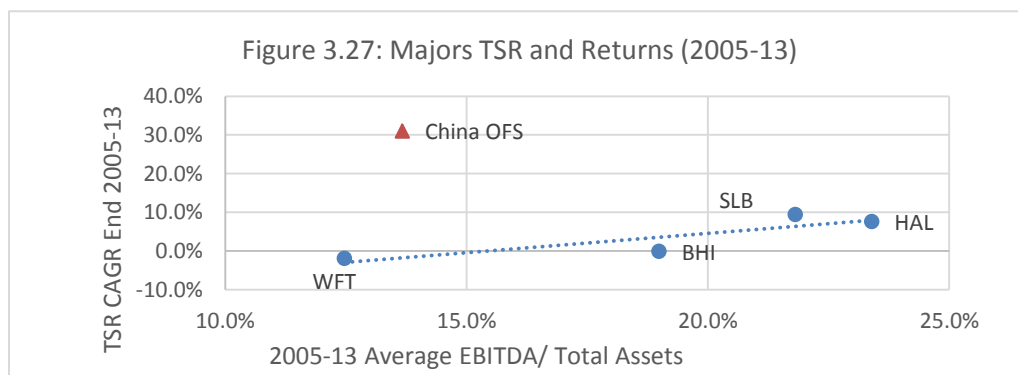


We added China Oilfield Services (quoted on the Hong Kong market) to the “big four” oilfield service companies offering a wide range of products and services to oil companies in order to start a discussion on the role the Chinese service companies may play in the future. We found that China OFS’ shareholder value creation has substantially exceeded that provided by the traditional players (Figure 3.26) by virtue of the growing offshore capital spending of its former parent company CNOOC.

Majors’ TSR is strongly dependent on EBITDA/ Total Assets returns (Figure 3.27). There has been a lower correlation with Revenue Growth or Risk (Table 2.2). This suggests that investors are looking for solid returns, limited growth and no surprises from this sub-sector. Halliburton and Schlumberger appear to be meeting these expectations, while Baker Hughes and Weatherford are not. Schlumberger and Halliburton have been particularly successful in providing “integrated solutions” to National Oil Companies and have invested in infrastructure to support their NOC relations.

We found that the best predictor of the big four majors’ earnings has been the total revenues of the hydraulic fracturing OFS segment. Each of the companies has a substantial share of this market (Figure 3.28) and with other related segments such as horizontal drilling, completions

and

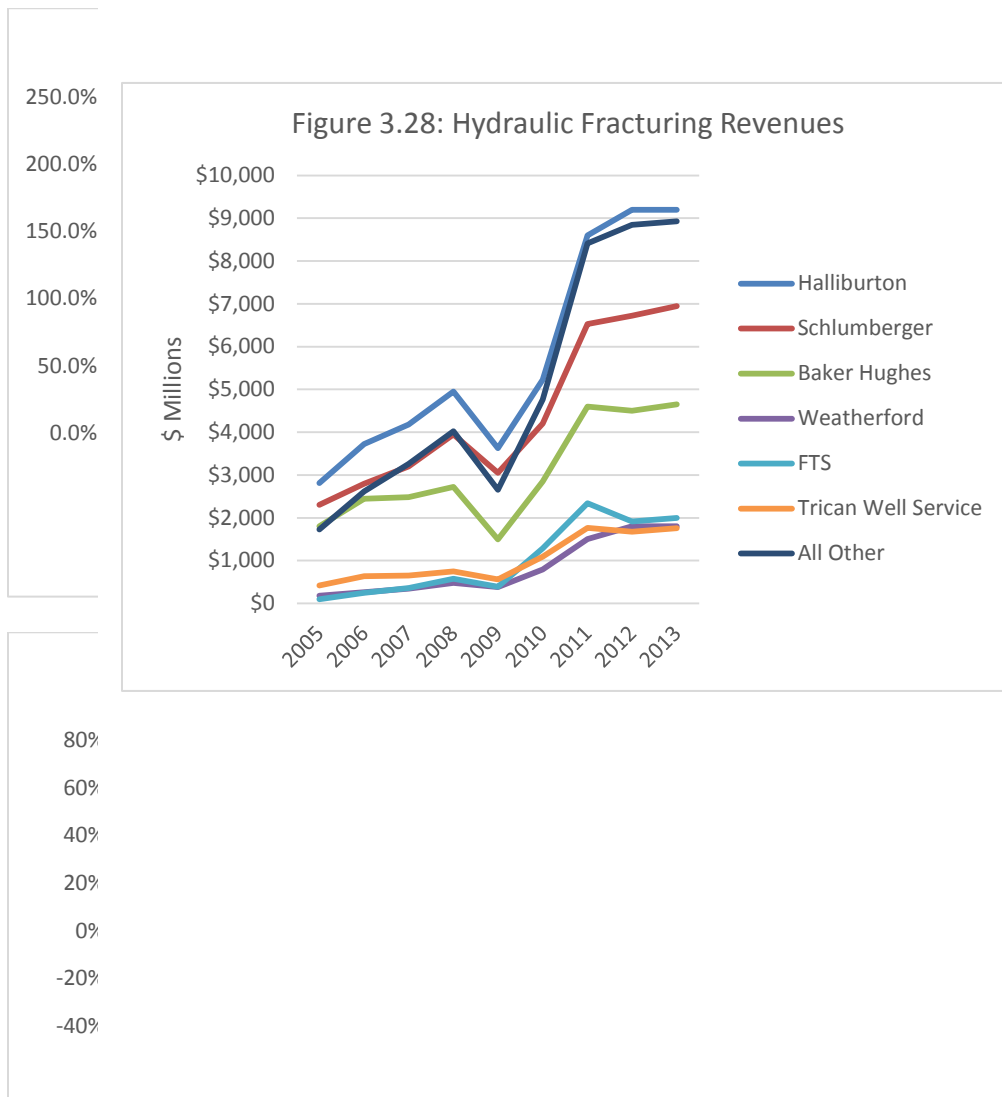


Value Creation by Oilfield Service Companies

downhole tools (see Table 1.2).

Using the relationship between earnings and total hydraulic fracturing segment revenues for each company, we applied our standard model to estimate intrinsic value and compared estimated intrinsic value to market-based enterprise value at end 2013.

A critical assumption is the companies' reinvestment in capital expenditures. SLB reinvests (average from 2005-13) 50% of operating cash flow⁴, Halliburton 60%, Baker Hughes 70% and WFT over 100% (Figure 3.29). BHI capex ratio increased during the great recession then increased further but declined somewhat in 2013.



Assuming Baker Hughes and Weatherford reduce capital spending to 70% of cash flow, we find that HAL and SLB are slightly undervalued in the market (Figure 3.30), BHI slightly

⁴ Defined as income before taxes excluding unusual items, less pro-forma taxes of 35% plus depreciation

overvalued (but would be correctly valued if it were to reduce capex to 60% of operating cash flow), and WFT would still appear to be overvalued even if it were to reduce capital spending to 60% of cash flow. However, it seems likely that the market is expecting that revenues from the hydraulic fracturing segment will decline from the torrid 20.4% p.a. of 2010-13 to 18% p.a. In this case, Halliburton and Schlumberger enterprise value would be consistent with intrinsic value. Baker Hughes would appear slightly overvalued and Weatherford considerably overvalued. WFT is undertaking a substantial portfolio rationalization and cost reduction initiative, and perhaps investors believe that this effort will bear fruit, though the WFT portfolio contains few gems with significant market share on which to build a profitable growth engine.

Major Company Reviews

Schlumberger (NYSE: SLB) was founded by two eponymous brothers as a well logging company in the Alsace region of the French-German border. In 1926, they opened their doors as the Société de Prospection Électrique, or “Pros” as it was nicknamed. In the wake of World War II and the USA’s position as a global technology leader, the company moved its headquarters to Houston, TX in 1940. Following several years of successful technology innovation, Schlumberger opened their first research center in Ridgefield, CT in 1948. In the early 1950’s Schlumberger Limited was created as a holding company as the brothers began to focus their sights on bolstering operations through restructuring and strategic acquisitions. They first bought 50% of the Forex drilling company in 1952 and, four years later, acquired Johnson Testers, the first of many acquisitions enabling Schlumberger to supply a more complete spectrum of formation evaluation measurements.

The next 50 years were characterized by much of the same, only to the ‘nth’ degree, as acquisition after acquisition continued to broaden the product and service line spectrum of the company. In the 60’s, through mergers and acquisitions, they expanded their expertise to include pumping services for the oil industry, electrical logging and measurement instrumentation and drilling. In the 70’s, oil well production, computer-based research and directional drilling and mud logging services were added to the repertoire. A flood of acquisitions in the 80’s and 90’s led to further restructuring of Schlumberger subsidiaries including the creation of Anadrill and SEDCO. In 1992, Schlumberger followed Halliburton (which had acquired Landmark Graphics) into the seismic workstation and imaging field by acquiring Geoquest.

In 2000, Schlumberger reinforced its seismic offering by combining Geco-Prakla with Western Geophysical to create WesternGeco, 70%-owned by Schlumberger and 30% by Baker Hughes. Six years later Schlumberger bought Baker Hughes’ stake to take full ownership of WesternGeco. Later in 2000, Schlumberger acquired Aberdeen-based Data Marine Services, an oilfield communications firm. In 2003, the company acquired a stake in PetroAlliance

Value Creation by Oilfield Service Companies

Services Company Limited, a leading Russian oilfield services company. Following this, the opening of the Schlumberger Russia Technology Hub within the campus of Gubkin Russian State University of Oil and Gas a year later reflected the growing importance of the Russian energy sector. A merger with Smith International in 2010 widened Schlumberger's lead as the world's largest oilfield services company in terms of revenue and market capitalization. Smith and M-I SWACO technologies and expertise complement Schlumberger's offerings, while benefitting from Schlumberger's large geographical footprint. The acquisition of Geoservices, also in 2010, expanded Schlumberger's products and services in mud logging, slickline and production surveillance operations. The first decade of the millennium for Schlumberger was filled with over 20 additional acquisitions in a successful attempt to increase the service offerings spectrum and ultimately shareholder value.

Schlumberger is a global leader in oil services with enterprise value of around \$120 Bn, much larger than Halliburton (\$50 Bn), Baker Hughes (\$30 Bn) and Weatherford (\$20 Bn), reflecting its greater size and scope of operations, providing everything from wireline and testing to artificial lift and coiled tubing and more. In addition to its strong position, the company is helped by a growing industry, due to the increasing service intensity of Arctic drilling, deep-water exploration, global explosion of unconventional drilling, and mature field management. Schlumberger has developed one of the widest channels of oil services and is thus positioned for years of growth. Schlumberger is a leading supplier of technology, integrated project management and information solutions to customers working in the oil and gas industry worldwide. Schlumberger manages its business through 35 GeoMarket regions, which are grouped into four geographic areas: North America, Latin America, Europe & Africa, Russia, Middle East and Asia. The GeoMarket structure offers customers a single point of contact at the local level for field operations and brings together geographically focused teams to meet local needs and deliver customized solutions.

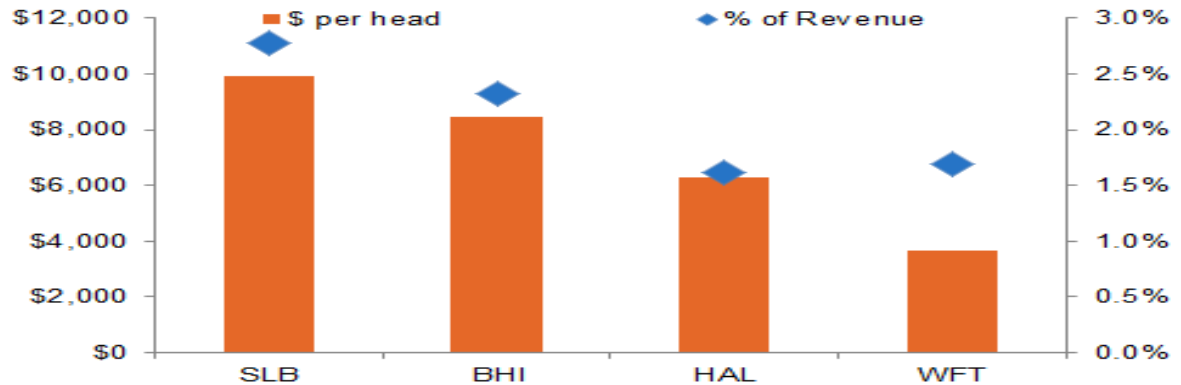
Today, Schlumberger products and services include open-hole and cased-hole wireline logging; drilling services; well services, such as cementing, coiled tubing, stimulations and sand control; well completion services including well testing and artificial lift; interpretation and consulting services; and integrated project management. The Schlumberger offerings combine domain expertise, innovative technologies, and high-quality support aimed at helping its customers increase oilfield efficiency in a safe, environmentally sound manner. They have been particularly successful in offering integrated solutions to National Oil Companies including management consulting to strengthen their decision quality and operations capabilities as well as providing integrated field development planning and execution services. Their management team is unique in its national diversity and the company is renowned for its thorough training and personnel development programs.

The company has been successful in growing revenues while maintaining strong returns and is disciplined in capital expenditures, while spending more than its rivals on research and

Value Creation by Oilfield Service Companies

development (Figure 3.31). It can continue along its current path and deliver good and predictable returns to shareholders by growing prudently and maintaining capital discipline.

Figure 3.31: Major OFS Company Research and Development Expenditures



Source: Company filings, Oilpro estimates

Schlumberger has an interesting, internationally diverse Board with a strong scientific and high technology expertise, but weaker on industry experience for a score of 1.6/3.0.

Schlumberger enterprise value is explained by its intrinsic value assuming a modest reduction in revenue growth in hydraulic fracturing and related segments.

Halliburton (NYSE: HAL) Halliburton is one of the leading oil services companies in the world. The company is a leader in North American unconventional oil and gas development services and plans to continue its expansion internationally.

Halliburton has extensive market coverage in over 80 countries. The company has dual headquarters in Houston and Dubai, but still generates approximately 52% of its revenue from the USA.

In the early 90's, Halliburton acquired the leading geophysical work station and visualization company Landmark Graphics. The company also acquired Dresser, and combined it with M.W. Kellogg and Brown & Root to create a new, larger subsidiary — Kellogg Brown & Root (KBR).

Over the past decade the Halliburton name has been somewhat tainted by association with former Halliburton CEO and former vice president of the USA Dick Cheney, by government contracts in Iraq awarded to its KBR subsidiary and by an asbestos suit against KBR. Going forward Halliburton has divested its KBR subsidiary and, along with other oilfield service companies, is expected to benefit from higher oil prices driven in part by growing demand from China and India.

2002 – 2005 Halliburton bought and sold off a series of technology driven or system business, including geo based and tools and equipment based business units.

Value Creation by Oilfield Service Companies

2007 - The company also benefited from the spinoff of its KBR unit in April of 2007. KBR performed much of the contracting work in Iraq that was the subject of negative publicity and government investigations. In addition to garnering negative press for the company, KBR generated only 5% margins. Halliburton's overall margins are closer to 25%

2008 - Halliburton Company (NYSE: HAL) completed the acquisition of certain assets of Pinnacle Technologies, Inc. on October 10, 2008

2009 - Boots & Coots, Inc. (AMEX: WEL) completed the acquisition of the external abrasive jet cutting systems business of Halliburton Company (NYSE: HAL) for \$0.42 million during the nine months ended September 30, 2009.

2010 - Halliburton Company (NYSE: HAL) completed the acquisition of Boots & Coots, Inc. (AMEX: WEL) on September 17, 2010.

2011 L'Air Liquids SA (ENXTPA:AI) and New Digit Nescience acquired Angola Nitrogen Business Unit from Halliburton Company

2012 - Halliburton Company (NYSE:HAL) completed the acquisition of Red Spider Technology specializing in Open Close Technology, down hole computer controlled valves from Energy Ventures III, L.P.

2013 - On August 29, 2013, the company announced that it repurchased 68,041,236 shares at a purchase price of \$48.50 per share, for a total of \$3.3 billion. The repurchase represents 7.4% of the total number of shares issued and outstanding as of August 26, 2013

2014 - Halliburton Energy Services, Inc. completed the acquisition of six horizontal wells in Texas of Thunderhead Petroleum II, LP on December 20, 2013.

Halliburton services are structured into 2 major business lines: Drilling and Evaluations, which includes Sperry drilling, braid, wireline and perforating, drill bits and series, Landmark software, testing and subsea, consulting and project management; the other business line consists of artificial lift, , Boots and Coots, production enhancement, cementing, and completion tools.

Halliburton's geographical operations remain heavily focused on North America:

- North America 52 % of revenue
- Middle East/Asia Pacific 17 % of revenue
- Europe/Africa/CIS 18 % of revenue
- Latin America 13 % of revenue

Major Revenue generators by market segments

Value Creation by Oilfield Service Companies

Halliburton is one of the leading oil services companies in the world. The company is a premier leader in North American unconventional oil and gas development services and plans to continue its expansion internationally. Halliburton is a large cap company with \$47.7 billion market capitalization (2013, Q1) Halliburton has averaged a 29.84 billion market capitalization over a ten year period.

Halliburton has extensive market coverage in over 80 countries. As a result of its broad international exposure, Halliburton is vulnerable to geopolitical instability, however Halliburton's geographic diversification actually lowers risk. Acts of terrorism, regime changes and other disruptive acts can negatively impact Halliburton's businesses. Conversely, the company is still incorporated in the U.S., generating approximately 52% of its revenue from this country. This keeps it extremely sensitive to downturns in the U.S. economy as well as changes to U.S. environmental legislation, seasonal weather at home and abroad.

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Going forward Halliburton has divested its KBR subsidiary and, along with other oilfield service companies, is expected to benefit from higher oil prices driven in part by growing demand from China and India.

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Value Creation by Oilfield Service Companies

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2014 - Halliburton Energy Services, Inc. completed the acquisition of six horizontal wells in Texas of Thunderhead Petroleum II, LP on December 20, 2013.

The scope of Halliburton services are broken into 2 major business lines: drilling and evaluations, which includes Sperry drilling, braid, wireline and perforating, drill bits and series, Landmark software, testing and subsea, consulting and project management; the other business line consists of artificial lift, Boots and Coats, production enhancement, cementing, and completion tools.

Halliburton's geographical operations remain heavily focused on North America:

- North America 52 % of revenue
- Middle East/Asia Pacific 17 % of revenue
- Europe/Africa/CIS 18 % of revenue
- Latin America 13 % of revenue

Halliburton's Portfolio Includes Market Leadership Positions in Several Segments

Market Segment Leaders	Revenue	Percentage of Total Segment
1 st Cementing	\$ 3,550	35%
2 nd Coiled Tubing	\$ 700	21%
1 st Completion Systems	\$ 3,325	28%
3 rd Directional drilling	\$ 2,250	16%
3 rd Drill bits	\$ 845	16%
1 st Hydraulic Fracturing	\$ 9,200	26%
2 nd Logging While Drilling	\$ 1,200	30%

Halliburton's long-term strategic plan moving forward is to shift focus from the Western Hemisphere to the Eastern Hemisphere. As Halliburton adds business with Eastern

Value Creation by Oilfield Service Companies

Hemisphere National Oil Companies and continues to serve the majors internationally, Halliburton is investing in new manufacturing capacity closer to key markets, to lower the costs of moving materials, products, tools and people. Like Schlumberger, Halliburton has been successful in developing integrated solutions for National Oil Companies. This strategic plan continues to guide the company, but the rapid growth of shale oil and gas development in North America has resulted in substantially increased demand for products in Halliburton's sweet spots of horizontal drilling services and hydraulic fracturing, such that North America remains its strongest market.

The company's business strategy is to secure a distinct and sustainable competitive advantage as an oilfield service company by delivering services and products that enable its customers to extract proven reserves and maximize recovery, in new, midlife and mature fields.

Halliburton has a robust research and development capability, though spending relatively less than SLB and BHI (Figure 3.31), which it believes is creating distinctive products that bring competitive advantage:

- Q10™ Pump -Significantly lowers downtime and maintenance costs
- Mobile Technologies - Increases back office efficiencies
- SandCastle™ Vertical Storage Bins - Reduce footprint at significantly lower operational and capital costs
- Wellhead Connection Unit - Enables quick rig-up between wellheads on multi-well pads
- Remote Operations Centers - Allows engineers and customers to monitor and operate multiple well sites from a central location

Halliburton also intends to focus on leveraging service intensity within four primary thrusts:

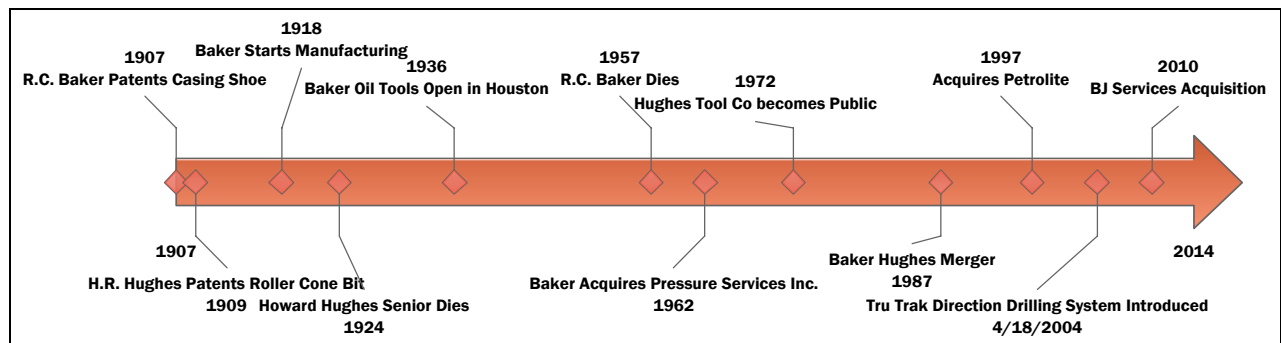
- Investing for the up-cycle
- Integrating across broad diversified service offerings
- Expanding its robust technology portfolio
- Balancing growth and returns

Halliburton's Board has a reasonable level of relevant experience for a score of 2.2/3.0.

Schlumberger enterprise value is explained by its intrinsic value assuming a modest reduction in revenue growth in hydraulic fracturing and related segments.

Value Creation by Oilfield Service Companies

Figure 3.32: Baker Hughes (NYSE: BHI) history stretches back to 1907:



Baker Hughes Inc. was formed in 1987 by merging Baker International and Hughes Tool Company. Baker International originated from R.C. Baker whose business began when he patented a casing shoe that advanced oil well cementing. Meanwhile, H.R. Hughes, Sr. patented a cone roller which made it possible to drill through harder and deeper rock. Both companies acquired, divested, and grew several portions of the oilfield service while keeping a tradition of technical innovation.

Within the last ten years, Baker Hughes has been busy innovating and growing its oilfield services business. Major events include the major acquisition of Western Atlas in 1998, “Auto Trak” closed loop drilling system featuring directional drilling, and the 2010 purchase of BJ services, which is known for pressure pumping technologies.

Baker Hughes Inc., provides equipment and services over a wide array of the oil and gas industry. Their products and services cover the space from drilling, evaluation, completion, production and intervention of oil and natural gas wells. The company operates in four major regions of the world:

- North America
- Latin America
- Europe, Africa, and Russia
- Middle East and Asia Pacific

Within these four major regions, Baker Hughes is in over 80 countries and has exposure in some form or fashion to all of the oil and gas producing regions. Even with this broad exposure in the international markets, Baker Hughes still enjoys the largest share of its revenues (49% as reported in 2013) from North America. The company has 12 major service lines they provide to their customers worldwide:

- Integrated Operations
- Reservoir Services
- Drilling

Value Creation by Oilfield Service Companies

- Evaluation
- Completions
- Production
- Pressure Pumping
- Tubular Services
- Process and Pipeline
- Downstream Chemicals
- Specialty Chemicals
- Total Depth Education

Unlike Schlumberger and Halliburton, BHI does not provide software suites such as offered by Geoquest and Landmark, nor a well-established comprehensive integrated solutions offering to provide full field development planning and execution for National oil Companies. Baker Hughes' long term corporate strategy is similar to other oilfield service companies and involves increasing their presence globally with the intention of increasing profits by capitalizing from high growth, less competitive opportunities in emerging markets. Baker Hughes will continue to fund research and development centers in Brazil and Saudi Arabia, expand core services to include critical capabilities and emerging technologies, and maintain liquidity and financial flexibility.

As noted previously (Figures 2.29 and 3.31), Baker Hughes has been spending more freely relative to its size on capital projects and research and development than its larger rivals. At the same time, its gross margin has been declining, suggesting an increasing commodification of its product line. These factors have lowered its EBITDA/ Total Assets returns and its intrinsic value and will continue to do so unless the company can provide clear visibility to resulting benefits.

BHI has a solid Board with good upstream and OFS experience for a score of 2.4/3.0. Its enterprise value represents a 15.1% premium over calculated intrinsic value, which would be justified if the company would reduce its capital spending to proportionately match its larger rivals.

Weatherford International (NYSE WFT), domiciled in Switzerland, has grown rapidly by acquisition since CEO Bernard Duroc-Danner joined the company's predecessor EVI, Inc. in 1987 and was elected CEO in 1990. EVI merged with Weatherford Enterra in 1998 to form Weatherford International, at which time Duroc-Danner became CEO.

Weatherford International has had an extremely volatile last 10 years, with great expansion of revenue and tremendous growth of their stock price during the mid-2000s. This was followed by a large fall from grace beginning during the Great Recession of 2008 and continuing through today. To further understand what exactly happened to a company which once

Value Creation by Oilfield Service Companies

looked so promising, it is imperative to take a look back at what was the cause of their success as well as where they fell short.

Weatherford was buying companies to increase revenues at a fast past during the 1990s and early 2000s.

Starting in 2004, Weatherford purchased W1 Receivables, L.P, and Jupiter Securitization Corporation. This purchase of W1 Receivables was thought by management to be strategic way to help manage Working Capital in the form of collecting receivables in a more efficient manner. The Jupiter purchase was thought to be a mechanism to debt and equity issued into the market without having to use third parties, therefore removing the cost of underwriting and issuing new debt and equity.

In 2005, Weatherford purchased Precision Drilling Corporation to expand their upstream operations.

In 2007, they made a sizeable investment in ResLab, which is a subsidiary that is devoted to their researching and consulting group.

In 2009, the made a \$65 million investment in Integrity Delaware, LLC to expand their downstream chemical and commodities business arm.

Beginning in 2009, Weatherford started experienced major accounting issues with respect to their financial reporting, specifically around the operations in the Middle East around Iraq. From 2010 to 2013, they were required to restate their earnings and refile their 10k reports, as there were material discrepancies in their accounting concerning revenues from these operations.

Weatherford International Ltd. provides equipment and services over a wide array of the oil and gas industry. Their products and services cover the space from drilling, evaluation, completion, production and intervention of oil and natural gas wells. The company operates in four major segments of the world:

- North America
- Latin America
- Europe, West Africa, and Russia
- Middle East, North Africa, and Asia

Within these four major regional segments, Weatherford is in over 100 countries and has exposure in some form or fashion to all of the oil and gas producing regions on the globe. Even with this broad exposure in the international markets, Weatherford still enjoys the

Value Creation by Oilfield Service Companies

majority large share of its revenues (45% as reported in 2012) from North America. The company has 10 major service lines they provide to their customers worldwide:

- Artificial lift systems
- Stimulation and chemicals
- Drilling services
- Well construction
- Integrated drilling
- Completion systems
- Drilling tools
- Wireline and Evaluation Services
- Reentry and Fishing
- Pipeline and Specialty Services

Of the above ten services, Weatherford is a leader with respect to total revenue in 3 of the 10 services; artificial lift systems, casing and tubing, and rental and fishing. They have the fourth largest market share in 2 of the 10; completion systems, rental and fishing and drilling tools. In the remaining sectors where Weatherford operates, they are not significant players.

Weatherford posted the fastest revenue growth among its rivals from 2005-2013, but by far the lowest EBITDA/ Total Assets returns and highest beta (Figure 3.25 - 3.27). Moreover, WFT is the only one of the four North American majors with a high debt load. The problem has been that the acquisitions appear to have been expensive and somewhat haphazard and the resulting business portfolio lacks coherence; further, the resulting geographical and product complexity has made it difficult to rationalize supply chains and lower costs. High capital spending has contributed to low returns, while relatively low spending on research and development has not delivered distinctive products.

The company is currently engaged in an initiative to simplify its portfolio, sell redundant businesses and reduce its cost structure. Enterprise value implies that the market is positive about the outcome of this initiative.

The Weatherford Board is weak with a preponderance of financial experts implanting by shareholder activists but with limited oil or OFS experience for a score of 1.6/3.0.

Weatherford's enterprise value represents a 65.1% premium over calculated intrinsic value, suggesting a strong level of confidence that the activists will force a successful portfolio rationalization initiative. However, it will be difficult to construct a coherent, strong portfolio from the current mix of assets.

Value Creation by Oilfield Service Companies

China Oilfield Services (SEHK 2883) began as the oilfield services functional organizations of CNOOC, the Chinese National Offshore Oil Company:

February 15, 1982 - China National Offshore Oil Corporation (CNOOC), PRC State-owned Enterprise Established; eventually turns into China Oilfield Services Ltd.

December 25, 2001 - CNOOC provided drilling, well and geophysical services primarily through five PRC wholly owned subsidiaries. On December 25, 2001, CNOOC incorporated these five companies as the operating company CNOOCS for the business operations that perform drilling, well and geophysical services.

December 29, 2001 - CNOOC combined two marine support and transportation subsidiaries, China Offshore Oil Southern Shipping Company and China Offshore Oil Northern Shipping Company, into one entity.

September 26, 2002 - The Company was restructured into a Joint Stock Limited Liability Company; with the approval of the PRC Government, COSL was officially chartered with the State Administration for Industry and Commerce.

November 20, 2002 - China Oilfield Services Limited was successfully listed on mainboard of Hong Kong stock market. Ticker (SEHK: 2883)

March 26, 2004 - The stocks of China Oilfield Services Limited can be traded by means of level 1 unlisted American Depositary Receipts "ADRs" at OTC over-the-counter market in the United States. The ticker symbol is CHOLY.

October 28, 2007 - China Oilfield Services Limited was successfully listed on Shanghai stock exchange.

September 29, 2008 China Oilfield Services Limited completed the acquisition of Awilco Offshore (ASA) successfully for \$3.9 billion.

Current Scope of Operations

The company's business operations take place in Southeast Asia, the Middle East, Australia, the North Sea, Northern Europe (Scandinavia), and North America. China Oilfield Services Limited (COSL) is an integrated oilfield service solution provider with nearly 50 years of experience in offshore operation. COSL listed in both Shanghai and the HK Stock Exchange (601808.SS/2883.HK). With its four major business segments of geophysical services, drilling services, well services and marine & transportation services covering the exploration, development and production phases of oil and gas industry, COSL is an all-round offshore oilfield service company with integrated functions and bundled service chain in China and in the rest of the world.

From the COSL web site:

Value Creation by Oilfield Service Companies

COSL possesses the largest fleet of offshore oilfield services facilities in China. At the end of 2013, COSL operated 40 drilling rigs of which 30 are jack-up drilling rigs and 10 are semi-submersible drilling rigs, 2 accommodation rigs and 4 module rigs. In addition, COSL also owns and operates the largest and most diverse fleets in offshore China, including 69 working vessels and 3 oil tankers, 4 chemical carriers, 7 seismic vessels, 2 OBC teams, 7 surveying vessels, and an array of modern facilities and equipment for logging, drilling fluids, directional drilling, cementing and well work-over services, including FCT (Formation Characteristic Tool, FET (Formation Evaluation Tool, LWD (Logging-While-Drilling), and ERSC (ELIS Rotary Sidewall Coring Tool) , etc.

COSL can provide customers with operation services for a single business and integrated package & turnkey services as well. COSL's services not only cover offshore China but also extend to Southeast Asia, Australia, Middle East, America, North Africa, and North Europe etc.

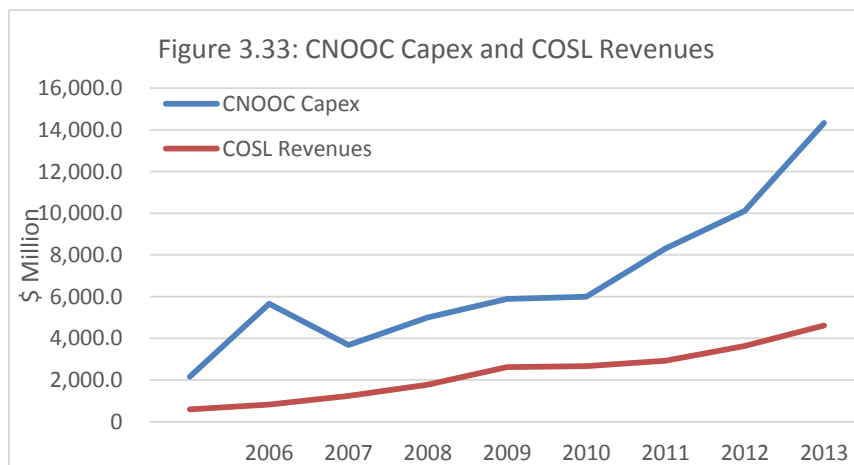
COSL employees always adhere to the international QHSE standards and commit themselves to providing first-class services for customers. COSL has obtained the International Safety Management (ISM) certifications, and the QHSE Management System certificates issued by DNV in compliance with ISO9001, ISO14001 and OHSAS18001 standards.

With the concept "ALWAYS DO BETTER", COSL endeavors to provide safe, high-quality, high-efficiency, and valued services for domestic and international customers to realize win-win with shareholders, customers, employees and partners and head towards being one of the world's top-notch oilfield service companies.

COSL has offices in Houston, Mexico, Canada, Indonesia, Australia, Myanmar, Dubai, Iraq, and Norway, where it provides contract drilling. COSL revenues have been propelled by CNOOC capital spending, though COSL's share has declined with the integration of Nexen, which uses a variety of outside service providers (Figure 3.33).

COSL can continue to grow profitably with CNOOC, but it is difficult to validate the current enterprise value using our standard model for want of a well-defined driver of cash flow. COSL enterprise value at end 2013 was \$19.5 Bn. COSL cash flow grew at an average of 29.0% pa

from 2005-13, which if continued would lead to an intrinsic value of \$38.9 Bn. But from 2010-13, cash flow grew at 10.6% pa, leading to an estimated intrinsic value of \$8.3 Bn. In Section 3.2, we concluded



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that the valuation of other offshore drillers appeared to assume a forward offshore drilling revenue growth rate of 11% pa, so unless COSL is able to boost profitability and/or capture significant global market share, the end 2013 enterprise valuation appears very optimistic.

The COSL Board is made up mainly of insiders and Party nominees. It is not comparable to the other Boards discussed in this report. Its enterprise value is compatible with calculated intrinsic value if the company can return to 20% p.a. revenue growth levels.

4. Conclusions

The Oilfield Services Sector produced a mixed bag of shareholder returns from 2005-2013: 12 of the 25 companies studied delivered TSR higher than the 5% pa recorded by the S&P 500 index, so slightly more than half the companies underperformed the SPX.

The five sub-sectors studied fall into three categories with distinctively different value drivers, leading to different natural strategies, required capabilities and corporate leadership and organization attributes.

Investors value companies in the **Drilling** and **Offshore** Construction Sub-Sectors that deliver Growth **and** Returns: Driller TSR is more closely correlated to Growth and Offshore Construction TSR is more closely correlated to EBITDA/ Total Assets Returns. Both these segments construct complex, capital intensive assets and then operate them on behalf of their oil and gas company customers on terms that are negotiated with upstream operators and generally provide only modest returns.

- Natural strategies are to concentrate on a single **drilling** segment (e.g., Helmerich and Payne on land-based horizontal drilling) or set of **offshore** construction challenges (e.g., Subsea 7 emphasis on subsea construction) with strong growth potential at which the company can excel, and eliminate activities not related to the chosen focus area(s). Acquisitions or mergers can be useful to boost growth so long as they lead to synergies that further strengthen returns on capital.
- Capabilities required include project management in supervising rig and offshore service vessel design and construction so that they will be delivered on time on budget; close relationships to become a trusted strategic partner with important, growing upstream operators and achieve high rig or vessel utilization factors; and operations excellence to assure safe and low cost operations.
- The desired leadership model should include a culture that values safety as paramount (e.g., awareness of the human and financial costs of the Macondo tragedy); decision rules developed collaboratively with the upstream operator and partners; performance metrics that reward speed and low cost but not at the expense of safety; and highly trained personnel who command the respect of their clients.

A provocative conclusion from analysis of the Equipment Sub-Sectors is that investors value returns positively but **penalize** higher growth achieved by sequential acquisitions. It appears that the better success model for this segment is to create distinctive products designed to solve the complex technical problems of developing difficult resources in difficult locations, enabling premium pricing and modest growth.

- Natural strategies are to emphasize technological innovation, uncovering advances outside the OFS Sector to incorporate in new distinctive products (e.g., Oceaneering's

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dominant position in ROVs based on initial military contracts) and to partner with upstream operator clients to create custom solutions to the technical challenges they face (e.g., FMC Technologies work on deep water subsea well-heads). Incremental expansion of product lines seem more likely to add shareholder value than acquisitions.

- Critical capabilities include highly skilled teams with a reputation for technological innovation, capable of working well with upstream industry clients; custom fabrication of specialty products at reasonable cost, with an eye on the potential for standardization (although this could put pressure on margins).
- The leadership model should reinforce a culture that values technical innovation that can be translated into distinctive products; decision rules that provide space for technical personnel to experiment; performance metrics that encourage innovation; and the attracting and developing new talent that can complement existing teams.

Finally, we found that the Seismic and Majors Sub-Sectors were most sensitive to Returns **and** Risk (Beta), implying that investors are looking for conservative financing and predictable, profitable operational and financial results from these sectors.

- Natural strategies should aim to create a strong competitor in every segment where the company competes with an “up-or-out” philosophy for underperforming segments (e.g., Halliburton’s strength in hydraulic fracturing), by offering leading technology solutions coupled with customer relations based on trust. Acquisitions should only be considered if they further strengthen existing segments or open up a new segment in which the company can be a profitable leader (e.g., Schlumberger’s continuous acquisitions of small technology companies to strengthen its lines of business). Financial strategies should be conservative to preserve a low beta. As will be discussed later, there may be a case for unbundling the products that are designed and manufactured in these companies from the services that utilize those products (e.g., it is questionable whether its subsidiary Sercel’s manufacture of Vibro-seis trucks adds value to CGG).
- Critical capabilities should support “no surprises” in which the company regularly exceeds performance expectations and include capital discipline (e.g., Weatherford overspending contributed to low shareholder returns), well designed budgeting controls, as well as operations excellence. Technology investments should be designed to reinforce the company’s leading position in its segments.
- The leadership model should reinforce a “no surprises” culture that values over-delivery on promises. Decision rules related to financial matters should be centralized and stress frugality. Operationally, business lines can be decentralized to assure accountability and delivery on promised budget metrics, but the performance management system should reward collaboration across businesses and deployment of best practices through support for shared supply chain and technology services.

We were able to relate enterprise value at 12/31/2013 to intrinsic value (NPV of expected cash flows discounted at the company’s cost of capital) for most companies. We also found a

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relationship between TSR and Board strength in terms of its concentration of members with oil and gas or OFS experience.

Two companies (TGS Nopec and FMC Technologies) appear undervalued relative to past performance. TGS Nopec enterprise value has increased in the first half of 2014, and the value discrepancy has been reduced; FMC Technologies may be perceived as vulnerable to loss of market share in its core subsea equipment segment. Seven companies appear potentially overvalued. Expectations for Oceaneering and Dril-Quip suggest accelerating growth in their core subsea niches, some of which may be at the expense of FMC. There appear to be high (perhaps too high) expectations for successful turnarounds under way at Weatherford, ION, and Nabors. Expectations are also high for improved profitability at Tidewater following renewal of its fleet. Baker Hughes may be valued in the market on the assumption that it will reduce its capital spending to match proportionately its larger rivals.

Overall, the relative success of the TGS “asset light” strategy and the high TSR of the Specialized Equipment Manufacturers set up some interesting strategic questions:

- How can companies in the Seismic and Majors segments lower their capital intensity or increase their margins and at the same time reduce risk?
- How can the Drillers and Offshore Construction segment members increase growth without overspending on new vessels and rigs? Would mergers improve their bargaining power relative to their customers?
- How can the Specialized Equipment Group expand their technical development pipelines to invent and commercialize more new distinctive, high margin products?
- Which companies might be more valuable if they severed equipment from services by spinning-off internal Specialized Equipment manufacturing units (and related R&D) into new companies and leasing rather than owning the equipment needed to provide their services?
- What new services can the Majors add by internal development or selective acquisitions to further increase EBITDA/ Total Assets Returns? Might there be strategic or operational synergies with divisions already in their portfolios?

These conclusions set out to explain the drivers of past performance. It is justifiable to question whether the same drivers will apply in the future. For example, if oil prices were to fall substantially, this would lower demand for oilfield services. This would lower overall revenue growth and probably put pressure on margins in all segments. However, the drivers of TSR for the Majors and Seismic segments would likely stay the same with an intensified focus on returns leading to synergy capture through mergers and acquisitions (at lower valuations than today). The Drillers and Offshore Construction segments would be pressured on Growth and Returns and would likely be obliged to consolidate. The Specialized Equipment segment would be under pressure to standardize and commoditize their products and lower margins; the only defense will be to continue to develop products that are considered “priceless”.

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If oil prices remain at current levels, there will be a continuing need for new technologies to find and safely develop difficult resources in difficult locations to replace declining production in mature fields. If oil and natural gas prices were to increase further, the rising tide would lift all boats until the next down-cycle.

In all cases, capital discipline, operational excellence and financial conservatism is essential for companies in the OFS industry to sustain financial performance and shareholder value and maintain their right to exist as independent companies in this highly cyclical industry.

5. Appendix

Appendix A: TSR and Selected Drivers

	TSR	Growth	Return	Risk
TGS	12.9%	15.6%	41.9%	1.166
ION	-9.0%	4.7%	17.8%	3.060
CGG	0.3%	15.5%	15.1%	1.912
DWSN	1.2%	11.3%	19.8%	1.670
PGS	4.5%	6.0%	23.8%	2.016
RIG	-3.8%	14.1%	11.8%	1.032
ESV	4.9%	18.9%	13.5%	1.293
HP	14.1%	17.4%	21.1%	1.244
NBR	-9.4%	6.8%	15.3%	1.595
NE	2.0%	12.9%	16.5%	1.185
China OFS	31.0%	20.7%	12.7%	1.348
WFT	-1.9%	15.0%	11.8%	1.717
SLB	9.4%	13.7%	20.1%	1.317
BHI	-0.1%	13.4%	16.9%	1.453
HAL	7.6%	12.6%	23.0%	1.447
SPM	5.1%	13.3%	9.7%	1.581
SUBC	7.9%	17.4%	11.1%	1.675
TDW	5.4%	6.7%	11.8%	1.265
MDR	2.0%	4.2%	9.3%	1.698
OII	26.0%	14.2%	22.6%	1.595
FMC	22.7%	9.7%	15.0%	1.221
CAM	14.1%	16.3%	12.8%	1.401
SBO	20.4%	11.5%	20.3%	1.191
NOV	13.2%	19.4%	13.6%	1.455
DRQ	21.2%	11.0%	18.4%	1.633

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Appendix B: Full Set of Financial Metrics

OFs Companies	Capex/ Total Assets	Revenue CAGR: Growth	EBITDA/ Total Assets:	Net Debt/ Total Assets	R&D+Inta ngibles/ Revenue	Acquis- itions/ Sales	Capex/ Depreci- ation	OCF/ Sales	WC/Total Assets	WC/ Sales	CAPEX/ Sales	EBITDA/ Capital Employed	Total Debt to Capitaliz- ation	Sustaina- ble Growth Rate	OCF/ CAPEX	Shareholder Cash Returns/OCF	ROIC	Market Cap Growth
TGS	1%	16%	42%	-22%	46%	4%	225%	68%	31%	60%	3%	52%	3%	20%	26.04	16%	20%	15%
ION	2%	5%	18%	12%	24%	7%	68%	19%	23%	32%	2%	25%	27%	6%	8.71	3%	-10%	-1%
CGG	4%	15%	15%	19%	9%	8%	76%	26%	15%	33%	9%	18%	35%	42%	3.03	1%	0%	14%
DWSN	18%	11%	20%	-14%	0%	0%	166%	16%	29%	26%	16%	23%	3%	12%	1.01	0%	7%	9%
PGS	10%	6%	24%	26%	15%	11%	207%	47%	12%	26%	21%	29%	42%	20%	2.23	5%	9%	7%
RIG	5%	14%	12%	28%	0%	8%	159%	36%	4%	16%	19%	14%	41%	6%	1.93	20%	5%	3%
ESV	9%	19%	14%	13%	0%	12%	323%	48%	7%	28%	37%	14%	22%	10%	1.28	22%	10%	11%
HP	17%	17%	21%	4%	0%	0%	283%	33%	10%	20%	33%	23%	11%	20%	1.00	6%	14%	18%
NBR	14%	7%	15%	28%	0%	2%	202%	28%	12%	25%	29%	17%	44%	6%	0.95	16%	5%	-4%
NE	16%	13%	16%	22%	0%	6%	319%	47%	4%	13%	51%	18%	28%	13%	0.93	16%	11%	4%
China OFS	9%	21%	13%	29%	2%	12%	214%	35%	11%	38%	31%	15%	49%	15%	1.14	11%	8%	29%
WFT	9%	15%	12%	33%	2%	3%	187%	9%	15%	26%	15%	15%	42%	7%	0.64	9%	2%	6%
SLB	8%	14%	20%	7%	4%	3%	139%	21%	17%	24%	11%	26%	25%	11%	1.90	42%	16%	12%
BHI	9%	13%	17%	9%	3%	1%	178%	10%	29%	35%	11%	20%	20%	9%	0.95	40%	10%	6%
HAL	10%	13%	23%	9%	2%	2%	198%	15%	33%	33%	11%	29%	29%	16%	1.44	41%	16%	10%
SPM	9%	13%	10%	21%	0%	1%	269%	9%	-6%	-8%	12%	23%	53%	17%	0.76	21%	11%	6%
SUBC	8%	17%	11%	-2%	0%	0%	241%	12%	8%	12%	12%	16%	19%	12%	1.06	21%	10%	26%
TDW	12%	7%	12%	9%	0%	0%	294%	30%	12%	35%	33%	13%	19%	6%	0.89	36%	9%	4%
MDR	6%	4%	9%	-17%	0%	1%	275%	8%	6%	6%	6%	17%	8%	20%	1.22	2%	13%	25%
OII	11%	14%	23%	2%	0%	2%	170%	16%	22%	22%	11%	29%	9%	20%	1.42	13%	15%	6%
FMC	5%	10%	15%	8%	1%	2%	250%	7%	19%	16%	4%	28%	33%	20%	1.61	51%	19%	19%
CAM	4%	16%	13%	0%	1%	2%	214%	9%	31%	39%	5%	19%	27%	9%	1.95	52%	10%	17%
SBO	9%	11%	20%	8%	1%	3%	161%	19%	31%	44%	12%	26%	33%	18%	1.52	21%	13%	20%
NOV	2%	19%	14%	-5%	0%	10%	118%	12%	27%	42%	3%	17%	9%	16%	4.62	10%	11%	28%
DRQ	5%	11%	18%	-23%	5%	0%	218%	14%	62%	95%	8%	21%	0%	17%	1.80	16%	14%	27%

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Appendix C: Enterprise Value at 12/31/2013 Compared to Standard and Adjusted Intrinsic Value

	Spears OFS Segment	Revenue Growth CAGR		Standard			Adjusted	
		Standard	Adjusted	EV	IV	EV/IV	Adj IV	Adj EV/IV
CGG	Geophysical	6.6%	1.0%	\$ 6.13	\$ 10.51	-41.7%	\$ 6.13	-0.1%
TGS Nopec	Geophysical			\$ 2.52	\$ 7.24	-65.2%	\$ 5.17	-51.3%
PGS	Geophysical			\$ 3.30	\$ 4.81	-31.4%	\$ 3.44	-4.1%
ION	Geophysical	6.6%	5.0%	\$ 0.73	\$ 0.54	35.1%	\$ 0.48	52.0%
Dawson	Geophysical			\$ 0.19	\$ 0.24	-20.6%	\$ 0.18	4.2%
Transocean	Offshore Drilling	8.5%	11.0%	\$ 25.32	\$ 19.33	31.0%	\$ 23.93	5.8%
Noble Corp.	Offshore Drilling			\$ 15.54	\$ 12.59	23.4%	\$ 15.51	0.2%
Ensco	Offshore Drilling			\$ 18.28	\$ 14.56	25.5%	\$ 18.22	0.3%
Nabors	Onshore Drilling	11.6%	3.0%	\$ 8.52	\$ 12.49	-31.8%	\$ 6.94	22.8%
H & P	Onshore Drilling			\$ 8.00	\$ 18.54	-56.9%	\$ 8.07	-0.8%
Tidewater	Supply Vessels	7.7%	11.0%	\$ 4.22	\$ 2.25	87.7%	\$ 3.03	39.3%
Subsea 7	Offshore Construction	7.8%	9.5%	\$ 7.10	\$ 6.14	15.6%	\$ 7.29	-2.7%
Saipem	Offshore Construction			\$ 16.91	\$ 14.50	16.6%	\$ 16.41	3.1%
McDermott	Offshore Construction			\$ 1.80	\$ 1.50	20.3%	\$ 1.67	8.0%
Schlumberger	Hydro Fracking	20.4%	18.0%	\$ 122.57	\$ 141.86	-13.6%	\$ 112.80	8.7%
Halliburton	Hydro Fracking			\$ 50.90	\$ 63.77	-20.2%	\$ 53.50	-4.9%
Baker Hughes	Hydro Fracking			\$ 28.65	\$ 29.69	-3.5%	\$ 24.90	15.1%
Weatherford	Hydro Fracking			\$ 21.07	\$ 15.03	40.2%	\$ 12.76	65.1%
China Oilfield	Extrapolated cash flow	10.6%	21.2%	\$ 19.46	\$ 8.30	134.5%	\$ 19.18	1.5%
NOV	Rig Equipment	9.8%	5.9%	\$ 36.00	\$ 50.64	-28.9%	\$ 36.10	-0.3%
Cameron	Surface Equipment	17.2%	14.5%	\$ 14.58	\$ 17.81	-18.1%	\$ 14.40	1.3%
Schoeller-B	Downhole Tools	15.1%	12.8%	\$ 1.71	\$ 2.05	-16.7%	\$ 1.69	1.1%
Dril-Quip	Subsea Equipment	18.5%	18.5%	\$ 4.04	\$ 2.26	78.6%	\$ 2.26	78.6%
FTI	Subsea Equipment			\$ 12.61	\$ 14.54	-13.3%	\$ 14.54	-13.3%
Oceaneering	Subsea Equipment			\$ 8.29	\$ 6.82	21.5%	\$ 6.82	21.5%
Notes:	Standard model segment revenue CAGR 2012-13 for Geophysical; 2010-13 for other segments							