Roland Berger Focus

May 2019

Chemical Winners 2018

Focus on profits

Roland Berger

Management summary

2018 was a strong year though growth slowed down for the Chemicals industry as a whole. Despite reduced growth and macroeconomic challenges arising from Brexit, increasing protectionism, trade uncertainties and a general economic slowdown, companies were able to generate returns of nearly 2 percent over the cost of capital. Key takeaways include:

> Invested capital grew by 1% despite revenue growth of 9%, driven by increased raw material costs
> Industry profitability held steady but overall profit dollars grew
> 64% of companies earned above their cost of capital – a 3 percentage point increase over the previous year
> Industry debt increased by 10% driven by the closing of several mega-mergers
> The Chemicals industry underperformed the S&P 500 for 2018, -8% TSR vs. -6% for S&P 500

It was evident that investors valued profitability over growth, which manifested within three indicators highlighted below:

> Companies that generated above-industry TSR were more profitability-focused than growth-focused
> There was reduced growth-focused M&A activity across all sizes of companies and all types of investors
> Instead of investing in inorganic growth, chemical companies returned more capital to shareholders and dividend payouts grew by USD 9 bn, 19% over 2017 levels

The Winners' analysis lets companies understand their performance relative to the industry. The Winners' metrics are described in more detail in Section 3. Our Roland Berger Chemicals team would welcome the opportunity to offer perspectives on company-specific performance and give you our external view on the strategic challenges facing the industry.

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Section 1:

Chemicals industry performance review

A solid year, marked by slower growth

2018 was a good year for the Chemicals industry. Despite slower growth than 2017, industry performance on profitability was strong. The year ended weak in the fourth quarter (driven by the oil-price collapse) but had stable or strong performance during the rest of the year. The Winners' metrics of risk-adjusted profitability (Return on Invested Capital (ROIC) – Weighted Average Cost of Capital (WACC)) indicated a healthy industry, albeit with slower growth than the previous year. Returns exceeded cost of capital by nearly 2 percentage points and the share of companies that earned above cost of capital grew by 3 percentage points over 2017. Invested capital growth was 1% as companies continued to invest in new assets, though it marked a significant slowdown from 2017 where companies saw invested capital growth of 13%. → A

Looking at the different geographies, the US Chemicals industry had a good year with high revenue growth (16%). However, most of this growth was the result of passing through the oil-price driven increases in feedstock prices. Production only grew by around 3% in line with GDP[1]. Outside the US, there was a distinct slowdown – the European Chemicals industry grew revenues by 3%, but production declined by 1%[2]. European chemical companies faced the added uncertainty of Brexit and its impact on the business climate and confidence in the EU. Consolidation and portfolio were the order of the day for European producers, as was evident by various actions taken by several large firms.

Overall, 2018 was a solid year for the Chemicals industry despite a slowdown relative to 2017, with a distinct shift towards profitability.

GROWTH

Invested capital growth of 1% reflecting fourth quarter oil-driven price pressures

Combined revenue of the 170 companies in our analysis grew by 9% relative to 2017. → A After adjusting for an increase in the average oil price [Brent oil price increased from an average of USD 54/bbl in 2017 to USD 71/bbl in 2018] and for currency effects, both of which had a tempering effect on growth, the net increase was only 3% in the US, in line with 2018 GDP growth at 2.9% and the ACC's production volume growth estimate of 3%. Invested capital growth slowed down to 1% over the previous year, largely driven by working capital collapsing in the fourth quarter because of feedstock prices declining with oil prices. It was clear that 2018 was not a strong growth year with reduced M&A activity and a lower level of investment following the boom in shale-gas related investments in 2012–2017.

MARGINS

Industry overall profitability held steady with profit dollars growing

EBIT margin held mostly steady at 12%, slightly down from 13% in 2017, but given revenue growth in the industry, EBIT dollars improved by 4% industry-wide. → A This reflected the challenges of passing through raw material price changes. Indeed, almost all segments in the industry saw a contraction in EBIT margins, with Specialty Chemicals and AgChem faring slightly better than the rest of the industry. The biggest increases were driven by some of the largest Commodity and Diversified companies.

[1] Based on ACC production volume estimates

[2] CEFIC – Chemicals Trends Report

A: Financial metrics

Chemicals industry financial performance dashboard[1]

		2018	2017	2016-2018 AVERAGE
GROSS PROFITS	Revenue growth [year-on-year]	9%	16%	6%
	EBIT margin	12%	13%	13%
CAPITAL PRODUCTIVITY	Working capital [as % of sales][2]	20%	19%	19%
	Asset turnover	0.6x	0.6x	0.6x
RISK	Debt/EBITDA	2.3x	2.2x	2.3x
WINNERS' METRICS	Median ROIC-WACC	2%	2%	1%
	Median invested capital growth	1%	13%	6%
	% of industry earning cost of capital (ROIC > WACC)	64%	61%	63%

[1] Includes 170 chemical companies with publicly available finances and headquartered or listed in developed markets
[2] Defined as (Accounts Receivable + Inventory – Accounts Payable)/Revenue

Source: Capital IQ, Roland Berger

RISK-ADJUSTED RETURNS

64% of companies earned above cost of capital, a 3 percentage point increase over 2017

Considering the risk-adjusted profitability [Return on Invested Capital (ROIC) – Weighted Average Cost of Capital (WACC)], which Roland Berger believes offers a better indication of true profitability, the industry earned above its cost of capital by 2 percentage points. Further, 64% of firms earned above cost of capital compared to 61% of firms in 2017. → A

Commodity companies led the pack with an average of 3% spread year-over-year, while pure-play Specialty companies and Industrial gases followed at 2%. → C

AgChem continued to see returns below cost of capital, despite revenue and profitability growth, as 2018 shaped up to be a challenging year, driven by the ensuing challenges for soybean & dairy exports from the trade war and a devastating hurricane season.

DEBT

Debt increased by 10% as companies took advantage of continued low interest rates and closed previously announced mega-mergers

2018 saw a continued trend of companies taking on more debt. Overall industry debt levels increased by 10% (in line with 2017) as players took advantage of continued low interest rates (prior to Fed-policy driven increases in 2018) to fund the closure of previously announced mega-mergers. → A Across the overall industry, most of the new debt was taken on by large diversified players and AgChem companies looking to close previously announced mergers or acquisitions.

TSR

The Chemicals industry underperformed the S&P 500 index in 2018

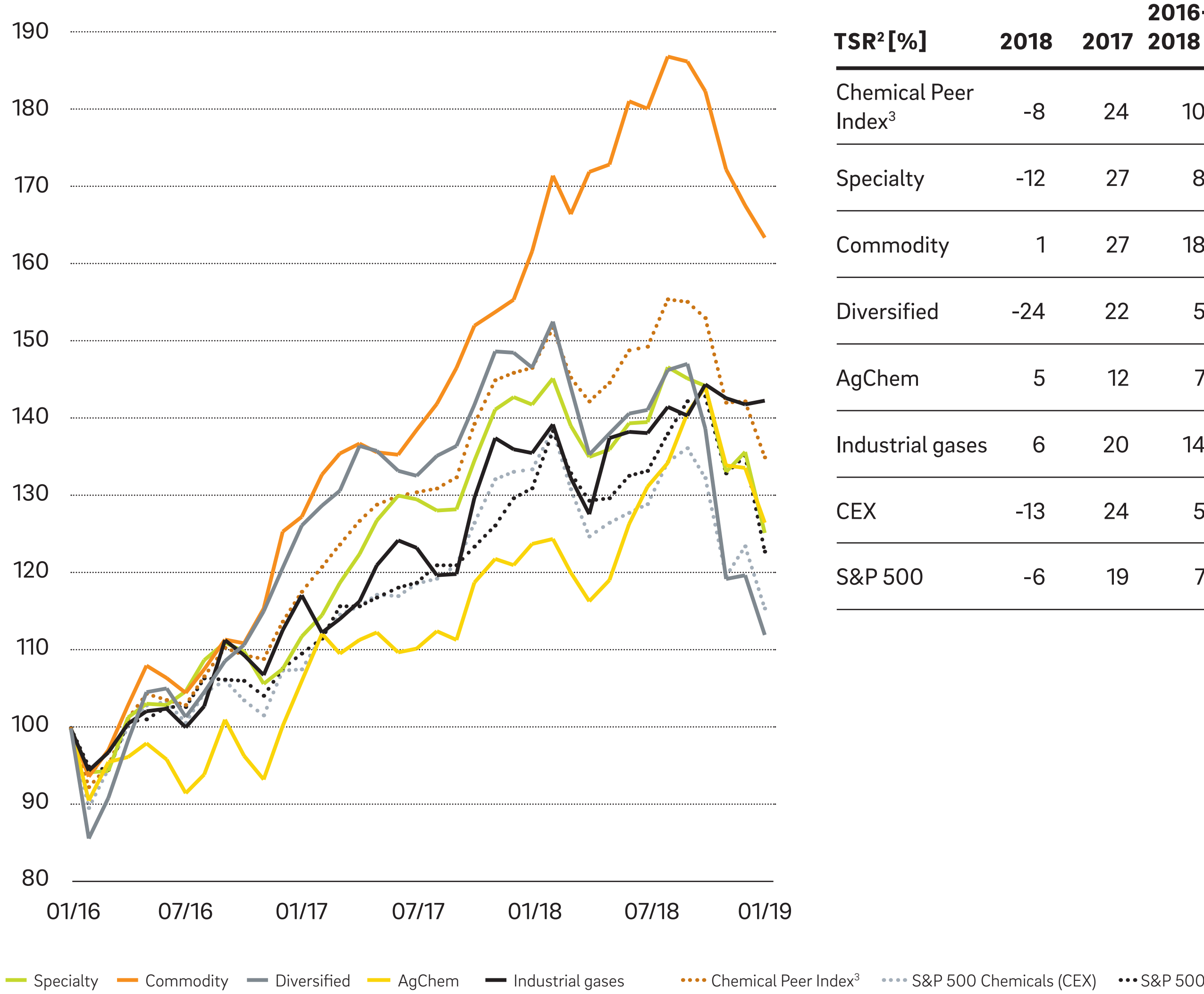
In 2017, the Chemicals industry outperformed the S&P by 5 percentage points, driven by strong US economic growth combined with the "Trump Bump" that saw favorable tax policies and the positive swing in oil price. 2018 saw a reversal in trend and the Chemicals industry underperformed the S&P 500 with returns declining by 8% in 2018 against a 6% decline in the S&P 500. → B From a 3-year perspective, the Chemicals industry outperformed the S&P 500 and delivered 10% returns year-on-year, influenced by spectacular returns across the board in 2017. The Winners companies in our analysis, however, saw stronger growth in TSR of 12.3% compared to companies in all other quadrants. → C

Much of the decline in 2018 was driven by Diversified companies, followed by Specialties, particularly due to some big players impacted by raw material pricing and industry consolidation.

Commodity businesses rode the oil wave as shareholder returns grew with rising oil price. However, they lost a significant share of those returns following the oil-price decline in the last quarter and ended the year at almost the same place as the beginning of 2018. AgChem saw a steady year in growth, driven by consolidation in industry structure following several mega-mergers and acquisitions that closed during the year, including Bayer-Monsanto, ChemChina-Syngenta and Agrium-Potash Corporation. Industrial gases also saw a steady year with moderate returns, driven by growth in end markets including frozen food (where gases can be used in place of chemical preservatives) and healthcare.

B: Value of USD 100 invested[1]

The chemical industry slightly outperformed the S&P 500 over the last 3 years with Commodities leading the pack



TSR[2] [%]	2018	2017	2016–2018
Chemical Peer Index[3]	-8	24	10
Specialty	-12	27	8
Commodity	1	27	18
Diversified	-24	22	5
AgChem	5	12	7
Industrial gases	6	20	14
CEX	-13	24	5
S&P 500	-6	19	7

[1] Total shareholder returns account for capital gains and dividends

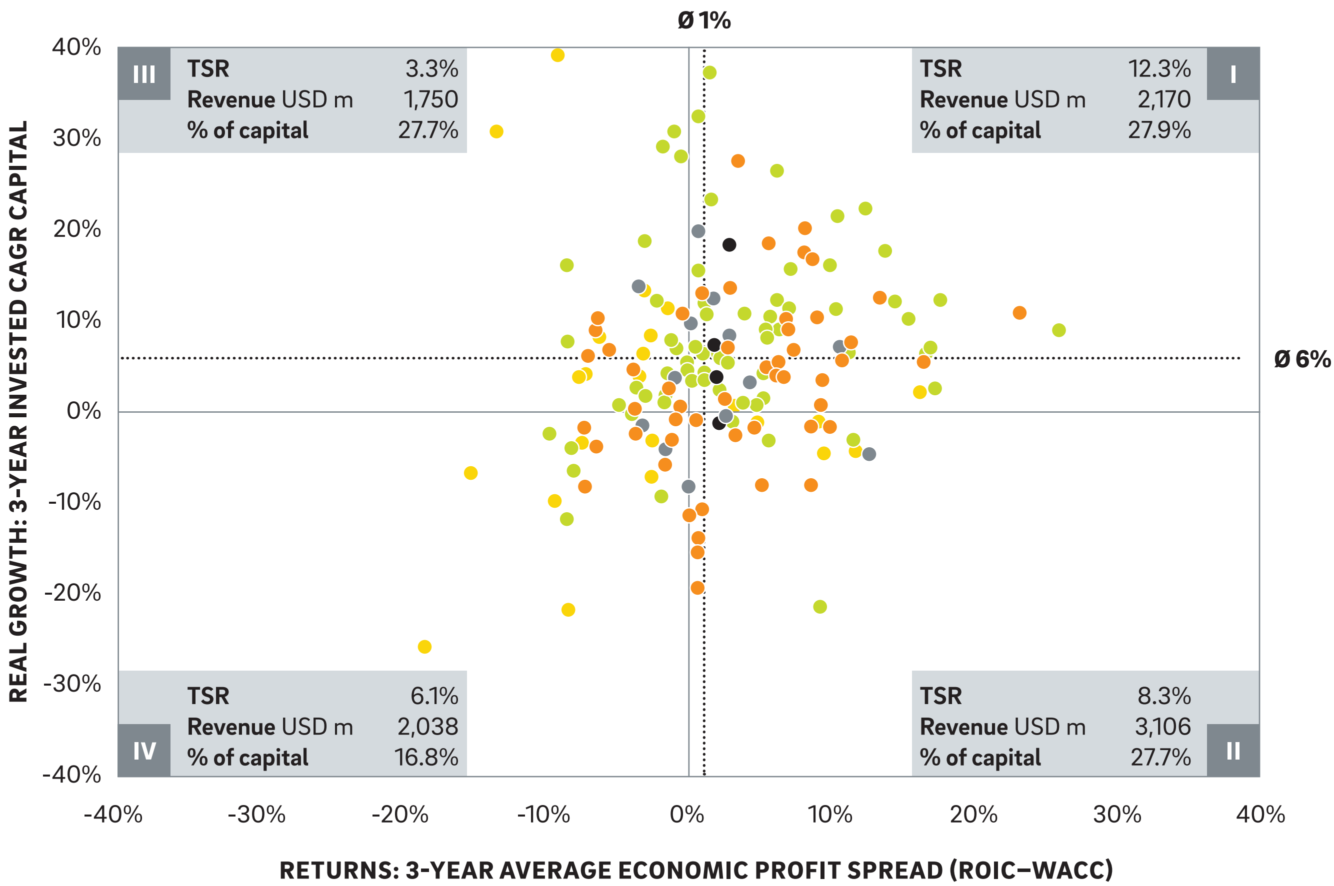
[2] 12/31/2017–12/31/2018, 12/31/2016–12/31/2017, 12/31/2015–12/31/2018

[3] Aggregation of all Chemical companies in the analysis

Source: Capital IQ, Roland Berger

C: Financial performance matrix[1]

Commodities performed well on profitability while Diversified and Specialty players did better on growth



SEGMENT	GROWTH	ROIC-WACC
Specialty	8%	2%
Commodity	4%	3%
Diversified	7%	0%
AgChem	0%	-3%
Industrial gases	7%	2%

[1] For 3 years 2016-2018. Includes 170 companies with financials for three full years during 12/31/2015–12/31/2018. The metrics displayed in the grey boxes are the median of the companies in that quadrant. The revenue is the median revenue for the period among the Winners

Source: Capital IQ, Roland Berger

Section 2:

Industry Spotlight

Rewarding profitability over growth

The broader theme of the Chemicals industry in 2018 was a general shift of focus from growth towards profitability. Companies that delivered the best shareholder returns were generally those that embarked on transformation programs capable of delivering both short-term and long-term performance improvement.

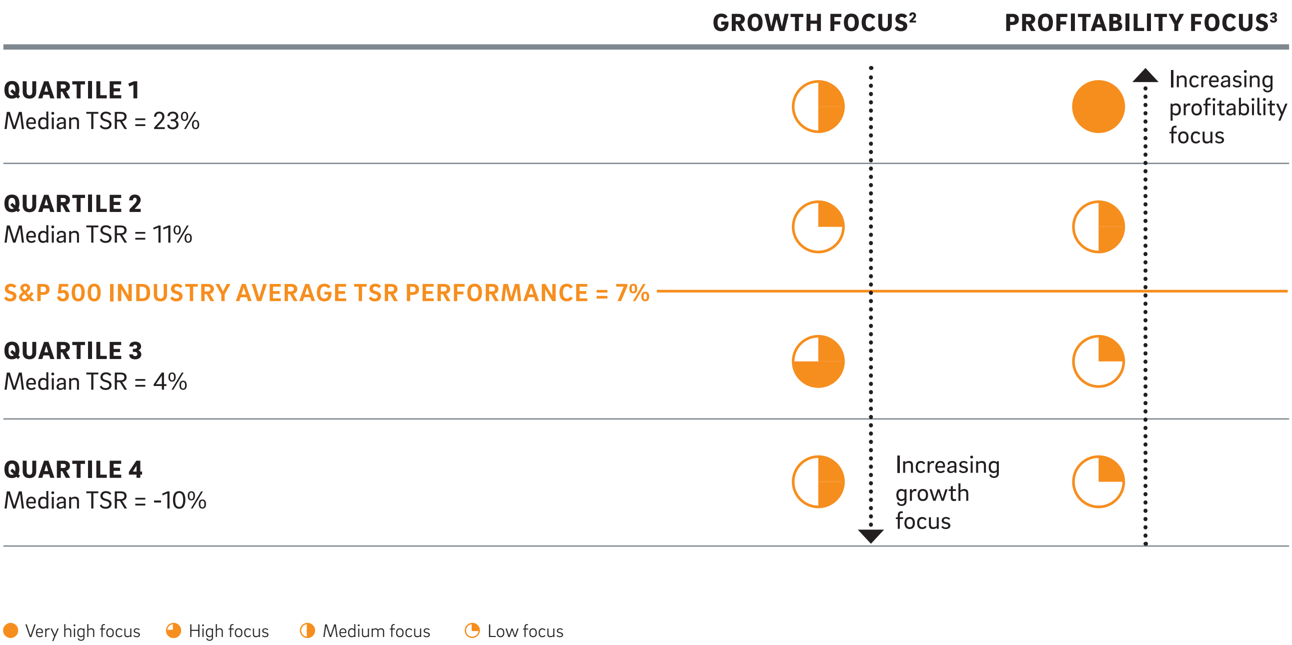
Our analysis of shareholder return performance vs. growth and profitability performance shows that investors clearly rewarded profits in 2018 – a notable difference to prior years where growth was more valued.

> Top shareholder return performers clearly had profit improvements driving their financial results

> By comparison, shareholder return laggards had a growth bias in their financial results → D

This focus manifested itself in many ways. M&A activity slowed down significantly, to a multi-year low, both in the reduced number of announced deals and total transaction value of all announced deals with published transaction values. → E

D: Growth and profitability focus for industry TSR quartiles[1]
Profitability and growth performance for industry TSR quartiles



[1] Based on 145 companies that reported all metrics for the three years – quartiles were defined based on 3-year average TSR performance [2] Growth is defined as delta between 3-yr Capital CAGR 2016-2018 and 3-yr Capital CAGR 2013–2015 [3] Profitability is defined as delta between Mean EP Spread 2016–2018 and Mean EP Spread 2013–2015

Source: Capital IQ, Roland Berger

This trend was consistent across all investor types – be it strategic or private equity. Also, less than 10% of all transactions announced in 2018 were by private equity players, both from the buy side and the sell side, compared to close to 15% in prior years. Further, M&A activity was focused more on consolidation through operations improvement and optimization, rather than growth or diversification. This was a continuation of a 3-year trend of consolidation across all key industry sectors, including AgChem, packaging, compounding, food ingredients and flavors.

With increasing uncertainty, getting paid today is more valuable than getting paid tomorrow and repayment to investors increased. Instead of investing in inorganic growth, chemical companies returned more capital to shareholders and dividend payouts grew by USD 9 bn, 19% over 2017 levels – three times their 5-year historical average growth rate.

While companies continued to talk about growth in their investor communications (as was seen in the high number of growth-focused mentions in investor material[3]), the focus of effort notably shifted towards performance improvement. While much of the previous year's performance improvement was driven by pricing and commercial excellence activity, there was a clear shift towards efficiency and cost take-out in 2018. Indeed, with an uncertain macro environment and volatile oil prices, the pricing lever was much more difficult to pull than in previous years.

Instead, there was a renewed emphasis on efficiency at all levels of organizations. A significant number of companies embarked upon transformation programs, aiming to drive short-term performance improvement and long-term competitive advantage: product complexity reduction, supply chain optimization, and SG&A redesign activities being the most prevalent, with digitalization often starting to play a significant role in enabling higher labor productivity and efficiency.

For 2019, this trend towards profitability is expected to continue, with even more visible impact from programs underway. All macroeconomic indicators point towards slower global growth and continued uncertainties driven by trade restrictions, Brexit and a volatile oil-price environment. In this environment, programs that improve the bottom line are more likely to be lauded by investors than growth or diversification efforts. Digitalization is also finally creeping into chemical companies as a significant enabler to the transformation programs that will position them to succeed in a volatile environment. Companies that critically review their performance and cost structure to identify levers to improve their profitability position would be rewarded with above-market performance and will be well-positioned to succeed despite these industry-wide challenges.

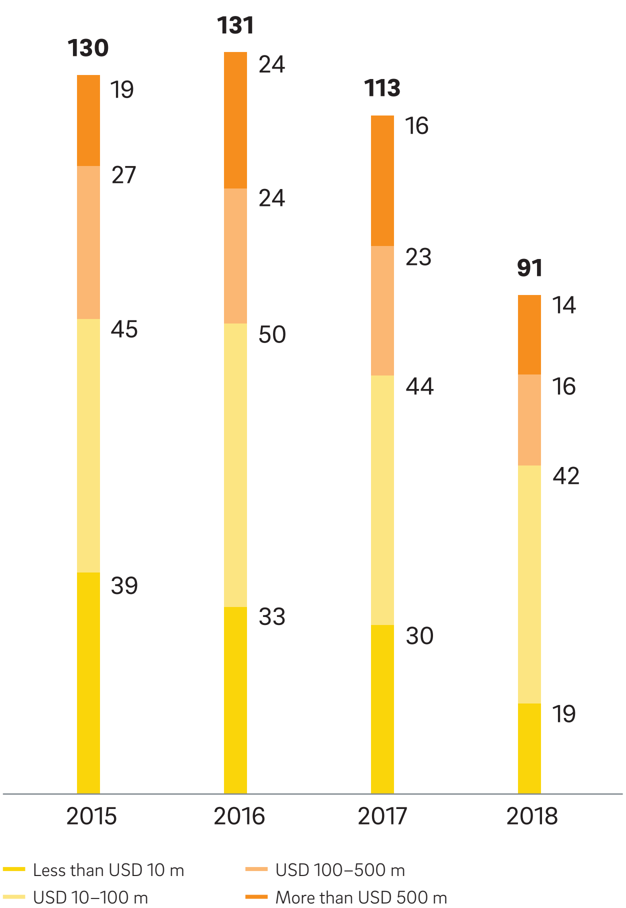
[3] There were nearly 3,000 growth-focused terms in investor documents released by the companies in our assessment. These included terms like grow, acquire, acquisition, expand, extend, diversify, innovate

E: Number of announced transactions by size and total value[1]

Both transaction volume and value trend has been decreasing moving forward to 2018

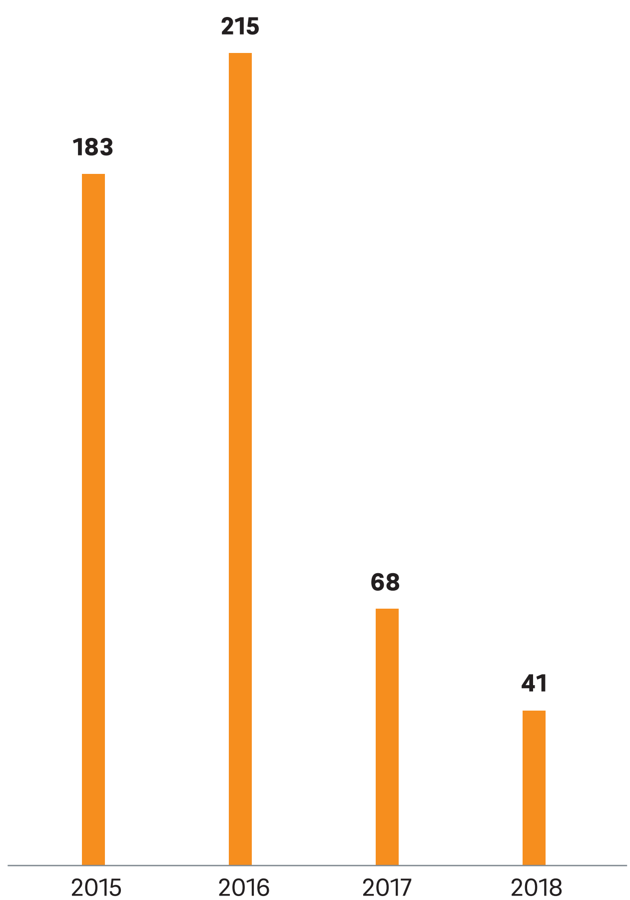
NUMBER OF TRANSACTIONS IN CHEMICALS

[2015–2018, #]



TOTAL TRANSACTION VALUE

[2015 – 2018, USD bn]



[1] Includes all chemical companies based on SIC classification with reported transaction value (465 out of 1,631 transactions) – Both acquisitions and mergers of majority stake included and based on announced date

Source: Capital IQ, Roland Berger

Section 3:

Roland Berger Winners' metrics

Appendix

As an analytical underpinning to our strategy and operations support to the Chemicals industry, we regularly monitor the financial performance of nearly 170 chemical companies headquartered in the US or in Europe. This document provides an inside look at the performance of the industry using both Winners' metrics and conventional financial metrics, and highlights trends that these numbers unveil.

When developing their expectations for the financial performance of a company, investors are both implicitly and explicitly analyzing its profitability and growth potential, and adjusting these metrics for risk. Typically, investors will develop a financial forecast to build a free cash flow model. Revenue growth will be used as the growth metric, EBIT margin percentage as the profitability metric, and the cost of capital will represent the risk adjustment. However, we believe the best metric to analyze growth is the real growth in the invested capital of a company, which represents the capital used to finance the company's assets. This is a better metric to measure growth compared to revenues, which is more commonly used. Revenue trends can be misleading due to price volatility, driven by raw material fluctuations or supply and demand dynamics. Invested capital growth measures the growth in assets and represents additional investment in the enterprise and is not as affected by raw material price changes. We believe the best metric to measure risk-adjusted profitability takes the difference between the return on invested capital (ROIC) and the weighted average cost of capital (WACC) into account. → F

This is better than EBIT margin because it is a normalized metric, which measures not only profitability, but the amount of capital required to generate the profitability. EBIT margins provide no perspective on the capital intensity of a company and therefore may be misleading when comparing companies with different business models.

Chemical Industry Winners
2015: A strong year for Chemicals despite macro headwinds

This article explores the performance of the Chemicals industry and lays down the path to profitable growth – to achieve Winners' performance, companies would need to achieve profit first, before they look for growth.

The Winners
How chemical companies deliver superior shareholder value

As part of our extensive strategy work in the Chemicals industry, we have observed that chemical companies deliver a very wide range of shareholder returns (dividends and capital gains). We thus set out to investigate how chemical companies create value for their shareholders.

F: The right metrics to measure growth, profitability and risk
Definition of economic profit in Winners analysis

INVESTED CAPITAL
Total Debt + Total Equity

RISK-ADJUSTED PROFITABILITY
ROIC − WACC

ROIC
Return on Invested Capital

$$\frac{\text{NOPAT (Net Operating Profit After Tax)}}{\text{INVESTED CAPITAL}}$$

WACC
Weighted Average Cost of Capital

$$\frac{\text{Cost of Equity} \times \text{Equity} + \text{After Tax Cost of Debt} \times \text{Debt}}{\text{INVESTED CAPITAL}}$$

Source: Roland Berger

G: Chemicals industry participation models[1]

Five participation models in the Chemicals industry

COMMODITY CHEMICALS

Companies that primarily produce industrial chemicals and basic chemicals including, but not limited to: plastics, synthetic fibers, films, commodity-based paints and pigments, explosives and petrochemicals

Examples:
- Chevron Phillips Chemical Co.
- Hexion Inc.
- Olin Corp.
- LyondellBasell Industries N.V.

DIVERSIFIED CHEMICALS

Manufacturers of a diversified range of chemical products

Examples:
- BASF
- Solvay SA
- Sasol Ltd.
- Dow

SPECIALTY CHEMICALS

Companies that primarily produce high value-added chemicals used in the manufacture of a wide variety of products including, but not limited to: fine chemicals, additives, advanced polymers, adhesives, sealants, specialty paints, pigments and coatings

Examples:
- Evonik Industries
- Ashland Inc.
- Balchem Corp.
- OMNOVA Solutions Inc.

INDUSTRIAL GASES

Producers of industrial gases

Examples:
- Air Products and Chemicals, Inc.
- The Linde Group
- Air Liquide SA

AGRICULTURAL CHEMICALS

Producers of fertilizers, pesticides, potash or other agriculture-related chemicals

Examples:
- Nutrien Ltd.
- ChemChina – Syngenta
- FMC Corp.

[1] Based on Capital IQ classification

Source: Capital IQ, Roland Berger

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WE WELCOME YOUR QUESTIONS, COMMENTS AND SUGGESTIONS

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About us

Roland Berger, founded in 1967, is the only leading global consultancy of German heritage and European origin. With 2,400 employees working from 35 countries, we have successful operations in all major international markets. Our 52 offices are located in the key global business hubs. The consultancy is an independent partnership owned exclusively by 230 Partners.

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Roland Berger has been helping its clients to manage change for half a century. Looking forward to the next 50 years, we are committed to supporting our clients as they face the next frontier. To us, this means navigating the complexities that define our times. We help our clients devise and implement responsive strategies essential to lasting success.

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