Large deals continue to dominate the M&A landscape and valuations remain high.

VIR LAKSHMAN | HEAD OF CHEMICALS & PHARMACEUTICALS, KPMG IN GERMANY

HIGHLIGHTS

— Strong start to Q1, 2019 with mega deals in both life sciences and chemicals.
— Big Pharma is strengthening its position in oncology through acquisitions and alliances.
— Financial sponsors show unabated interest in chemicals.
— Early-stage and digital start-ups continue to attract interest in both sectors.
— KPMG’s Deal Thermometer indicates that the environment for M&A activity will remain moderately strong in life sciences, with a slight slowdown in chemicals.

DEAL THERMOMETER Q1 2019

KPMG’s Deal Thermometer signals the environment for M&A deals in chemicals and life sciences. It combines the appetite for deals (changes in forward P/E ratios) with the capacity to fund deals (changes in Net Debt/EBITDA multiples). ‘Hot’ signifies an environment conducive to deal-making.

FIGURE 1: TRENDS IN LIFE SCIENCES M&A

FIGURE 2: TRENDS IN CHEMICALS M&A
The value of announced deals in Q1 2019 more than doubled compared to the previous year. Two announced deals surpassed the US$ 20 billion mark, with the largest deal since 2010 topping the deal list. Big pharma is jostling for position in oncology due to the attractive growth rates forecast. US remained the most active country in life sciences M&A, followed by China.

**DEAL FOCUS AREAS**

**Blockbuster deals in the US**

The US leads the life sciences deal landscape with 146 targets, accounting for more than 25% of life sciences deals announced in Q1 2019.

Bristol-Myers Squibb Co. (BMS) announced the US$ 90 billion acquisition of Celgene Corp., a global biopharmaceutical company, through a cash and stock transaction. Celgene is focused on the discovery, development and commercialization for the treatment of cancer and inflammatory diseases. The portfolios of BMS and Celgene are highly complementary. The combined company will have nine products creating more than US$ 1 billion annual sales. Expected near-term product launches represent revenue potential exceeding US$ 15 billion. BMS targets run-rate cost synergies of around US$ 2.5 billion by 2022. This is the largest life sciences deal since 2010.

Life sciences saw another blockbuster deal with Danaher Corp. announcing the US$ 21.4 billion acquisition of General Electric Co.’s (GE) BioPharma business. The cash purchase price offered represents a multiple of approximately 17x expected 2019 EBITDA. GE’s BioPharma business, with expected annual revenues of approximately US$ 3.2 billion in 2019, is focused on instruments, consumables and software supporting research, discovery, process development of biopharmaceuticals.

Eli Lilly and Co. announced the US$ 8 billion acquisition of Loxo Oncology, Inc., a biopharmaceutical company specialized in the development and commercialization of medicines for patients with genomically defined cancers. Through the transaction, Lilly broadens its oncology portfolio with approved and investigational medicines. Vitrakvi, added to Lilly’s portfolio as part of the transaction, treats patients with solid tumors with a neurotrophic receptor tyrosine kinase. It has been recently approved by the U.S. Food and Drug Administration.
Japanese PHC Holdings Corp. announced the US$ 1.1 billion acquisition of Thermo Fisher Scientific Inc.’s Anatomical Pathology business. With approximately 1,200 employees across the US, Europe and China, the business to be acquired is one of the leading providers of microscope slides, instruments and consumables. As part of Thermo Fisher’s Specialty Diagnostics Segment, the Anatomical Pathology business generates approximately US$ 350 million annual revenue.

Joining forces against cancer

With a projected CAGR of more than 12% between 2017 and 2024, oncology offers attractive opportunities for investors.

GlaxoSmithKline plc and Merck KGaA announced the establishment of a global strategic alliance to develop and commercialize M7824, an investigational bifunctional fusion protein immunotherapy, potentially offering new methods to fight difficult-to-treat cancers. As part of the collaboration, Merck receives an upfront payment of € 300 million. The total potential deal value, consisting of the upfront payment, certain potential milestone payments and future approval and commercial milestones, adds up to € 3.7 billion. Through the alliance, GSK further strengthens its pharmaceutical pipeline, following the company’s recent acquisition of oncology-focused company TESARO, Inc.

AbbVie Inc. and Tizona Therapeutics, Inc. announced their global strategic collaboration focused on the development and commercialization of CD39-targeted therapeutics for the treatment of cancer. After Phase 1b studies, AbbVie has an exclusive option to lead global development and commercial activities, while Tizona has an option for co-development and co-promotion in the US. Furthermore, AbbVie and TeneoOne, Inc., an affiliate of Teneobio, Inc., announced a global strategic transaction for the development and commercialization of an immunotherapeutic for the potential treatment of multiple myeloma, which is one of the most common hematological cancers. TeneoOne will carry on the development of TNB-383B, a BCMA-targeting immunotherapeutic, through Phase 1. AbbVie receives the exclusive right for a possible acquisition of TeneoOne and to lead subsequent global commercialization and development of TNB-383B.

Takeda Pharmaceutical Company Ltd. and Memorial Sloan Kettering Cancer Center (MSK) announced a collaboration established to discover and develop chimeric antigen receptor T-cell products for the treatment of multiple myeloma, acute myeloid leukemia and additional solid tumor indications.

DIGITALIZATION IN LIFE SCIENCES

Janssen Pharmaceuticals, Inc., part of the Johnson & Johnson Family of Companies, and Apple Inc. announced a collaboration to investigate the impact of Apple Watch on the early detection and diagnosis of atrial fibrillation (AFib), as well as improved patient outcomes. In the US, AFib is responsible for approximately 750,000 hospitalizations each year. The collaborations brings together J&J’s expertise in treating cardiovascular diseases and Apple’s cutting-edge technologies.

Merck KGaA and Tencent Holdings Ltd., an internet-based technology enterprise, delivering integrated internet solutions, entered a strategic collaboration. The collaboration aims to combine patient-centric healthcare management and digital platforms, thereby raising public disease awareness and providing more accessible healthcare services through digital platforms in China.

Verily Life Sciences LLC, a subsidiary of Alphabet Inc., raised US$ 1 billion in an investment round led by Silver Lake Management, L.L.C. With external funding, Verily targets to increase flexibility and optionality, enabling the expansion of its core strategic focus areas.

CAPITAL INDEX

The MSCI World Index outperformed the MSCI World Pharma, Biotech & Life Sciences Index by more than four percentage points.
### TABLE 1: GLOBAL TOP DEALS ANNOUNCED IN Q1 2019

<table>
<thead>
<tr>
<th>BIDDER</th>
<th>TARGET</th>
<th>THERAPY AREA</th>
<th>DATE OF ANNOUNCEMENT</th>
<th>DEAL STATUS</th>
<th>TOTAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bristol-Myers Squibb Co.</td>
<td>Celgene Corp.</td>
<td>Cancer and inflammatory diseases</td>
<td>3 Jan 2019</td>
<td>Pending</td>
<td>90.0</td>
</tr>
<tr>
<td>Danaher Corp.</td>
<td>General Electric Co. – BioPharma business</td>
<td>Instruments, consumables and software for biopharmaceutical drugs</td>
<td>25 Feb 2019</td>
<td>Pending</td>
<td>21.4</td>
</tr>
<tr>
<td>Eli Lilly and Co.</td>
<td>Loxo Oncology, Inc.</td>
<td>Oncology</td>
<td>7 Jan 2019</td>
<td>Completed</td>
<td>8.0</td>
</tr>
<tr>
<td>Ethicon, Inc. (Johnson &amp; Johnson)</td>
<td>Auris Health, Inc.</td>
<td>Surgical robotics</td>
<td>13 Feb 2019</td>
<td>Pending</td>
<td>5.8</td>
</tr>
<tr>
<td>F. Hoffmann-La Roche AG</td>
<td>Spark Therapeutics, Inc.</td>
<td>Gene therapy</td>
<td>25 Feb 2019</td>
<td>Pending</td>
<td>4.3</td>
</tr>
<tr>
<td>Ipsen S.A.</td>
<td>Clementia Pharmaceuticals Inc.</td>
<td>Ultra-rare bone disorders and other diseases with high medical need</td>
<td>25 Feb 2019</td>
<td>Pending</td>
<td>1.3</td>
</tr>
<tr>
<td>PHC Holdings Corp.</td>
<td>Thermo Fisher Scientific Inc. – Anatomical Pathology business</td>
<td>Anatomical pathology</td>
<td>28 Jan 2019</td>
<td>Pending</td>
<td>1.1</td>
</tr>
<tr>
<td>Investor group¹</td>
<td>Verily Life Sciences LLC (minority stake)</td>
<td>Health data collection tools</td>
<td>3 Jan 2019</td>
<td>Completed</td>
<td>1.0</td>
</tr>
<tr>
<td>FUJIFILM Holdings Corp.</td>
<td>Biogen (Denmark) Manufacturing ApS</td>
<td>Biologics manufacturing</td>
<td>12 Mar 2019</td>
<td>Pending</td>
<td>0.9</td>
</tr>
</tbody>
</table>

¹ All numbers are in US$ billion – representing Enterprise Values where available. Financial investors are italicized.
² Including Silver Lake Management, L.L.C., Ontario Teachers’ Pension Plan and other global investment management firms.

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*Includes deals with a disclosed deal value

Sources: Thomson One, KPMG (Germany) Analysis

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The deal value of the global top 10 announced deals in Q1 2019 was **US$89.7 billion**

### TABLE 2: GLOBAL TOP DEALS ANNOUNCED IN Q1 2019

<table>
<thead>
<tr>
<th>BIDDER</th>
<th>TARGET</th>
<th>BUSINESS AREA</th>
<th>DATE OF ANNOUNCEMENT</th>
<th>DEAL STATUS</th>
<th>TOTAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saudi Arabian Oil Co.</td>
<td>Saudi Basic Industries Corp. (70% stake)</td>
<td>Petrochemicals</td>
<td>27 Mar 2019</td>
<td>Pending</td>
<td>69.1</td>
</tr>
<tr>
<td>Two bidders*</td>
<td>RPC Group Plc</td>
<td>Plastic packaging</td>
<td>8 Mar 2019</td>
<td>Pending</td>
<td>6.5</td>
</tr>
<tr>
<td>Merck KGaA*</td>
<td>Versum Materials, Inc.</td>
<td>Specialty materials</td>
<td>26 Mar 2019</td>
<td>Tender offer</td>
<td>6.0</td>
</tr>
<tr>
<td>Advent International Corp.</td>
<td>Evonik Industries AG – Methacrylates business</td>
<td>Methacrylates</td>
<td>4 Mar 2019</td>
<td>Pending</td>
<td>3.4</td>
</tr>
<tr>
<td>Sika AG</td>
<td>ParexGroup SA</td>
<td>Mortar solutions</td>
<td>8 Jan 2019</td>
<td>Pending</td>
<td>2.5</td>
</tr>
<tr>
<td>INEOS</td>
<td>The National Titanium Dioxide Company Ltd. – North American business</td>
<td>Titanium dioxide</td>
<td>18 Mar 2019</td>
<td>Pending</td>
<td>0.7</td>
</tr>
<tr>
<td>One Rock Capital Partners, LLC</td>
<td>Nexeo Solutions, Inc. – Plastics distribution business</td>
<td>Plastics distribution</td>
<td>8 Feb 2019</td>
<td>Completed</td>
<td>0.6</td>
</tr>
<tr>
<td>Nutrien Ltd.</td>
<td>Actagro, LLC</td>
<td>Soil and plant health products and technologies</td>
<td>5 Feb 2019</td>
<td>Completed</td>
<td>0.3</td>
</tr>
<tr>
<td>New Mountain Capital, LLC</td>
<td>ACETO Corp. – Chemicals business</td>
<td>Specialty chemicals and agricultural protection products</td>
<td>19 Feb 2019</td>
<td>Pending</td>
<td>0.3</td>
</tr>
<tr>
<td>Hubei Xingfa Chemicals Group Co., Ltd.</td>
<td>Hubei Xingrui Silicon Material Co., Ltd. (50% stake)</td>
<td>Silicone series products</td>
<td>4 Jan 2019</td>
<td>Pending</td>
<td>0.3</td>
</tr>
</tbody>
</table>

* All numbers are in US$ billion – representing Enterprise Values where available. Financial investors are italicized.

### FIGURE 10: CHEMICALS ANNOUNCED DEALS BY SIZE OF TRANSACTION Q1 2019*

- **<US$ 50 million**: 34 deals
- **US$ 50 - 500 million**: 54 deals
- **US$ 500 million - 1 billion**: 6 deals
- **>US$ 1 billion**: 7 deals

### FIGURE 11: CHEMICALS ANNOUNCED DEALS BY CATEGORY Q1 2019*

- **Industrial organic and inorganic chemicals**: 34 deals
- **Paints, varnishes and lacquers**: 11 deals
- **Rubber and plastics products**: 10 deals
- **Agricultural chemicals**: 8 deals
- **Other**: 47 deals

* Includes deals with a disclosed deal value.

**Sources:** Thomson One, KPMG (Germany) Analysis

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Chemicals

The value of announced chemical deals in Q1 2019 increased from US$ 24 billion to US$ 92 billion compared to the previous year. This is mainly attributable to Saudi Arabian Oil Co.’s US$ 69 billion blockbuster acquisition of Saudi Basic Industries Corporation. Deals were widely spread across the value chain with strong financial investor engagement. China and US remain the most active countries in chemicals M&A.

CHEMICALS DEAL MULTIPLES

Chemicals transactions multiples continue to increase. The figure below sets out indicative Enterprise Value / EBITDA multiples for various sectors in the chemicals industry. It is not fully representative as the underlying information to compute multiples is not published for all transactions. However, the analysis serves to describe broad valuation trends in the industry.

Basic chemicals

The multiple levels of 2017 and 2018 were maintained in Q1 2019. As an example, Advent International Corp.’s recently announced acquisition of Evonik Industries AG’s methacrylates business for € 3 billion reflects a sales / EBITDA multiple of approximately 1.5x and Bernstein Research estimates that Enterprise Value is approximately 10x the EBITDA average for the past four years.

Specialty chemicals

Specialty multiples are generally higher than those for basic chemicals.

LyondellBasell Industries N.V. acquired A. Schulman, Inc., a leading supplier of high-performance plastic compounds, composites and powders for US$ 2.3 billion. The total acquisition price represents an EBITDA multiple of 11.0x LTM Adjusted EBITDA (excluding synergies). Annual run-rate cost synergies of US$ 150 million are expected within two years. The transaction was completed in August 2018.

In November 2018, Cabot Microelectronics Corporation completed the acquisition of KMG Chemicals, Inc. for US$ 1.6 billion, which represents an EBITDA multiple of 13.5x. KMG is a global provider of specialty chemicals and performance materials. Annual run-rate cost synergies of approximately US$ 25 million are targeted within the first two years after closing the transaction.
FINANCIAL INVESTORS IN CHEMICALS

Financial investors have continued to invest heavily in chemicals transactions. The relatively high deal value of announced deals with financial investors in 2018 is mainly attributable to the US$ 12.5 billion acquisition of Akzo Nobel N.V.’s specialty chemicals business by Carlyle Group LP and GIC Private Ltd., announced in March 2018.

Financial investors participated in four of the top 10 announced chemicals deals in Q1 2019.

One Rock Capital Partners, LLC announced the US$ 0.6 billion acquisition of Nexeo Solutions, Inc.’s plastic distribution business (Nexeo Plastics). With polymer products and engineering resins, Nexeo Plastics is a leading global distributor of a broad range of plastics products. One Rock aims to create a standalone plastics distribution business, accelerating growth through strengthening relationships with customers and suppliers.

DIGITALIZATION & INNOVATION IN CHEMICALS

Evonik Industries AG announced the acquisition of Structured Polymers Inc., a technology start-up focused on 3D printing materials. Through the transaction, Evonik will gain access to a new patented technology, expanding the company’s portfolio of specialty polymer powders as part of the additive manufacturing market. Evonik made an initial investment in Structured Polymers in 2017.

Covestro AG and Haier Group, a household appliances brand, signed an agreement to establish a joint laboratory for the development of digital solutions using polyurethanes in appliance production. Both parties aim to develop innovative solutions for data collection and analysis, monitoring and continuously optimizing processes. Covestro contributes its experience with polyurethane and foam technologies, while Haier brings its expertise in industrial automation and the analysis of large volumes of data.

BASF SE announced a US$ 2 million investment into Alchemist Accelerator, LLC’s fund through BASF Venture Capital GmbH, promoting digital innovations in chemicals, thereby fostering value for customers and developing new business models. The Alchemist Accelerator is a venture-backed initiative, driving the development of seed-stage ventures. At least half of BASF’s investment will be allocated towards investments in 3D printing, agtech, material informatics, nutrition and technology game-changers.

Along with around 30 other companies of the plastics and consumer goods value chain, Covestro and BASF are part of the global Alliance to End Plastic Waste (AEPW). The alliance contributes over US$ 1 billion to help end plastic waste in the environment.

CAPITAL INDEX

The Bloomberg World Chemicals Index was outperformed by the MSCI World Index by approximately three percentage points.

FIGURE 14: CHEMICALS ANNOUNCED DEALS BY FINANCIAL INVESTORS

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Announced Deals</th>
<th>Deal Value in US$ bn.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>296</td>
<td>18.6</td>
</tr>
<tr>
<td>2015</td>
<td>355</td>
<td>18.0</td>
</tr>
<tr>
<td>2016</td>
<td>347</td>
<td>18.6</td>
</tr>
<tr>
<td>2017</td>
<td>337</td>
<td>16.7</td>
</tr>
<tr>
<td>2018</td>
<td>324</td>
<td>36.8</td>
</tr>
<tr>
<td>Q1 2018</td>
<td>82</td>
<td>16.9</td>
</tr>
<tr>
<td>Q1 2019</td>
<td>92</td>
<td>9.4</td>
</tr>
</tbody>
</table>

Sources: Thomson One, KPMG (Germany) Analysis

FIGURE 15: DEVELOPMENT OF CHEMICAL SHARE PRICES Q1 2019

<table>
<thead>
<tr>
<th>Month</th>
<th>MSCI WORLD INDEX</th>
<th>BLOOMBERG WORLD CHEMICALS INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAN</td>
<td>95</td>
<td>105</td>
</tr>
<tr>
<td>FEB</td>
<td>105</td>
<td>115</td>
</tr>
<tr>
<td>MAR</td>
<td>110</td>
<td>115</td>
</tr>
</tbody>
</table>

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BASIS OF DATA PREPARATION

Values and volumes used throughout the report are based on announcement date as provided by Thomson Reuters’ database Thomson One as of 31 March 2019, extracted up to and including 1 April 2019, and supplemented by additional independent research. Data available after publication date is incorporated in subsequent editions. This edition presents revised data for the years 2013 to 2016. This report includes disclosed and undisclosed values for M&A transactions including minority stake purchases, acquisitions of remaining interest, and recapitalizations and it explicitly excludes self-tenders and spinoffs. The published numbers of deals and deal values are based on the analysis of target companies which operate in the following subsectors:

**Life Sciences**
- Medicinal chemicals & botanical products
- Pharmaceutical preparations
- In vitro and in vivo diagnostic substances
- Biotechnology – biological products, except diagnostic substances
- Pharmaceutical wholesale
- Medical devices and diagnostics
- Plant sciences

**Chemicals**
- Clay, kaolin, ceramic & refractory minerals
- Chemical and non-metallic mineral mining, except fuels
- Fertilizers and agricultural chemicals
- Industrial gases
- Specialty chemicals
- Chemical wholesale
- Plastics and rubber components

KPMG’s Deal Thermometer is based on financial data as provided by S&P Capital IQ of public companies in the same sector as noted above with a market capitalization at quarter end of at least a $1 billion. For the life sciences sector, this comprises 270 public companies. For the chemical sector, this comprises 188 public companies.

**Sources**

Online databases:
- Thomson One (Thomson Reuters)
- Mergermarket
- S&P Capital IQ
- Bloomberg
- Evaluate Ltd.
- Various companies’ press releases