

Deal Capsule

Transactions in Chemicals & Pharmaceuticals

January 2017

“ We expect continued robust activity as Life Sciences companies jostle for biotech assets. Chemical companies will exercise their financial strength to invest in specialty chemicals. ”

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

HIGHLIGHTS

- M&A activity was robust in both sectors despite political uncertainty and regulatory concerns. Following 2015's year of the mega deal, the total pharmaceutical deal value dropped by 38%, as pharma share prices under-performed in 2016. Chemicals M&A remained fairly stable.
- Pharmaceutical M&A turned its focus on biotech targets to seize late-stage assets. Generics and animal health were further key areas of interest.
- According to a global survey conducted by KPMG in collaboration with Mergers & Acquisitions Magazine pharmaceuticals/biotechnology are expected to be among the top three industries most active in M&A in 2017.
- In chemicals, several mega deals are close to completion. Activity was spread across the value chain with a focus on agrochemicals. PE activity was subdued due to high valuations.
- KPMG's Deal Thermometer indicates that the environment for M&A activity will remain moderately strong in both pharmaceuticals and chemicals.

FIGURE 1: TRENDS IN PHARMACEUTICALS M&A

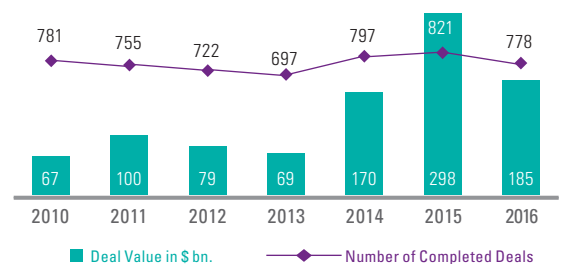
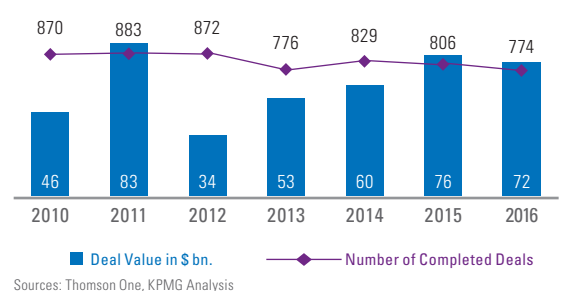
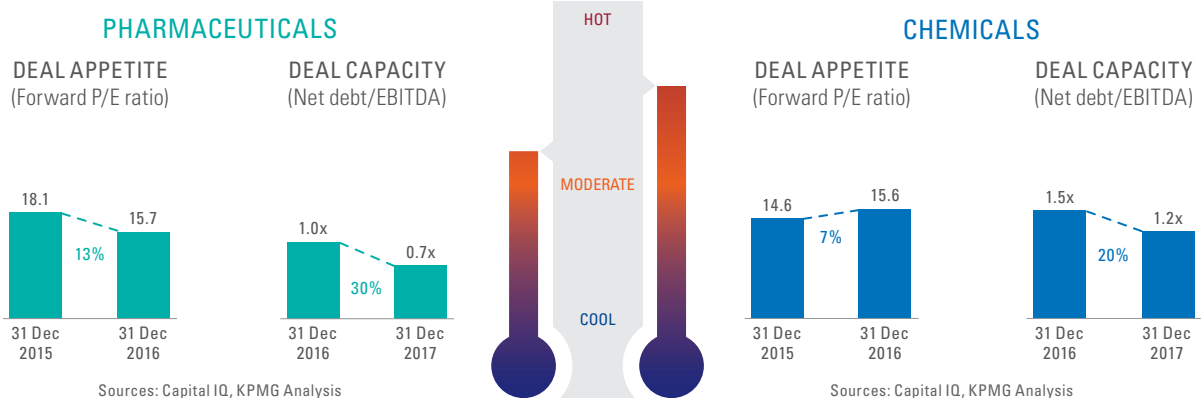


FIGURE 2: TRENDS IN CHEMICALS M&A



DEAL THERMOMETER 2016

KPMG's Deal Thermometer signals the environment for M&A deals in chemicals and pharmaceuticals. 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.



Pharmaceuticals

Pharmaceutical deal making remained buoyant despite a decline in landmark deals. Pharmaceutical players favored aspiring biotechs over conventional pharma assets. The value of deal activity decreased in comparison to the previous year: top 10 completions by 31 %, top 10 announcements by 93 %. US and China were the most active countries.

DEAL FOCUS AREAS

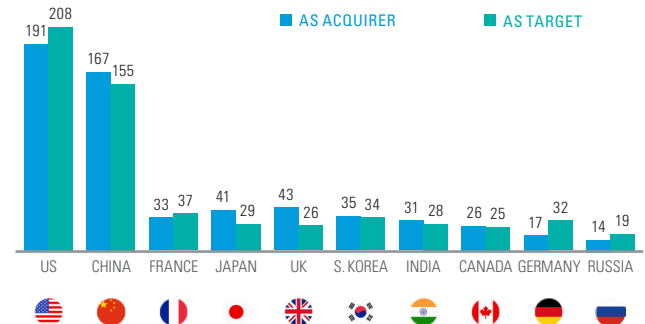
A series of biotech acquisitions, offering promising late-stage assets with blockbuster potential, were among the major transactions in 2016. Six of the top ten deal completions and 31 % of the total sector acquisitions were biotech deals (versus 27 % in 2015).

BIOTECH

Shire PLC led the way with the landmark acquisition of Baxalta Inc. for \$32.0 billion, accessing a distinctive portfolio of treatments for rare diseases and a cancer drug business. Previously, Shire had picked up Dyax Corp. for \$6.5 billion, adding promising late-stage rare disease compounds. Both deals strengthen Shire's position as a world leader in rare diseases.

Pfizer Inc. bolstered its oncology sales by acquiring Medivation Inc., a biotech specializing in cancer medication, for \$14 billion.

FIGURE 4: TOP COUNTRIES IN PHARMACEUTICALS M&A 2016



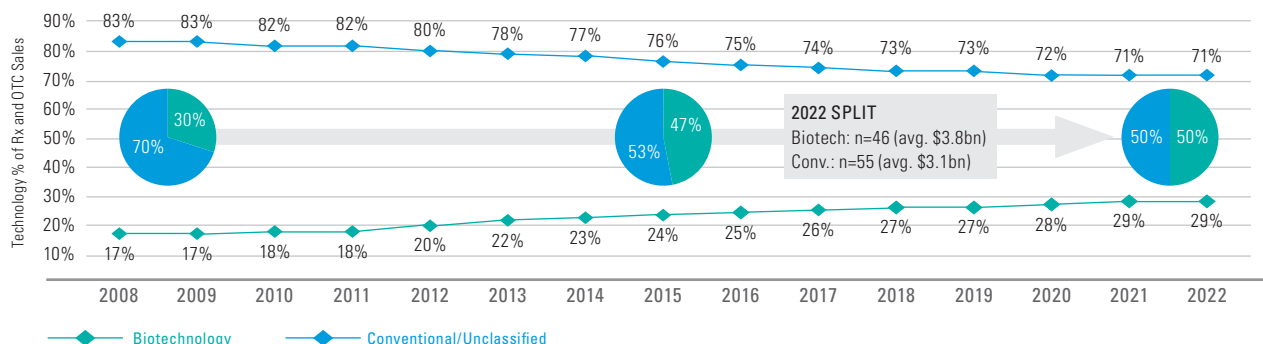
Sources: Thomson One, KPMG Analysis

Pfizer also bought Anacor Pharmaceuticals Inc. for \$5.2 billion, adding a topical gel under FDA review for which analysts predict best seller potential in dermatology.

AbbVie Inc. bought Stemcentrx Inc. to expand its oncology business in a deal worth \$9.8 billion – one of the five biggest acquisitions ever of a venture capital-backed company. Acquiring a stake in Acerta Pharma BV for \$4 billion, Astra Zeneca PLC complemented its immunotherapy portfolio, accessing a late-stage inhibitor for blood cancers and multiple solid tumors.

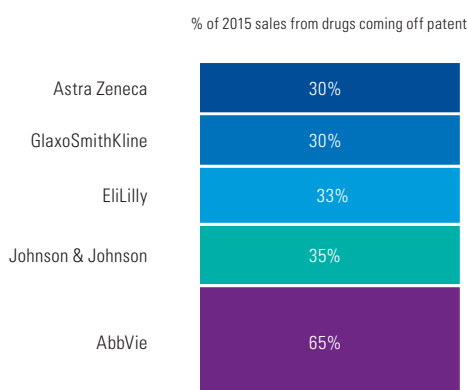
In late December 2016, Johnson & Johnson and Actelion Pharmaceuticals Ltd. confirmed exclusive talks regarding a potential strategic transaction. Actelion is a leader in pulmonary arterial hypertension, a disease which affects 100,000 people in the US and Europe.

FIGURE 3: WORLDWIDE PRESCRIPTION DRUG & OTC PHARMACEUTICAL SALES: BIOTECH VS. CONVENTIONAL TECHNOLOGY



Sources: Evaluate Ltd., KPMG Analysis

FIGURE 5: TOP 5 COMPANIES BY PATENT RISK BY YEAR END 2018



Sources: Evaluate Ltd., KPMG Analysis

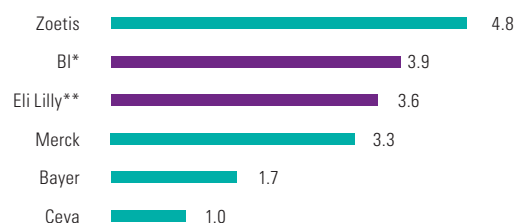
ANIMAL HEALTH

Deal activity in the animal health market was led by C.H. Boehringer Sohn AG & Co. KG (BI). BI announced a \$25 billion asset swap with Sanofi SA in 2015 under which it receives the animal health business Merial from Sanofi in exchange for its consumer health business.

BI has already initiated certain divestments to facilitate the regulatory approval process.

In Q3 2016, BI announced the divestment of its US feline, canine and rabies vaccines portfolio as well as its US manufacturing and R&D site to Elanco Animal Health Inc. for \$0.9 billion. BI has also announced the sale of various assets including vaccines and pharma-ceuticals for swine, bovine and companion animals to Ceva Santé Animale.

FIGURE 6: ANIMAL HEALTH MARKET, REVENUES 2015, \$ BILLION



*Pro-forma Boehringer and Merial excl. Boehringer Ingelheim Vetmedica Inc.

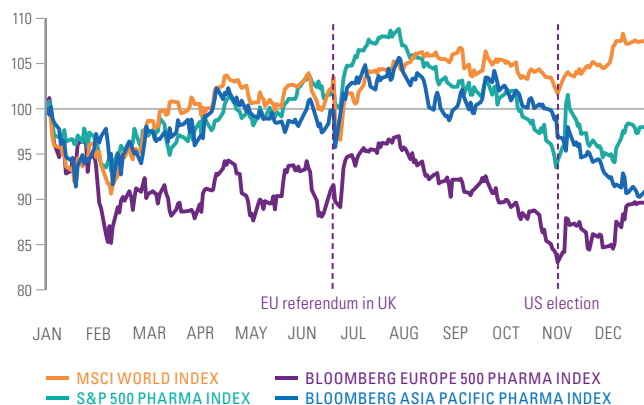
** Pro-forma Elanco and Boehringer Ingelheim Vetmedica Inc.

Sources: Annual Reports, KPMG Analysis

CAPITAL INDEX

Pharmaceutical shares experienced high volatility in 2016 in the wake of Brexit and the US election with the Europe 500 Pharma Index falling 11.2% over the year.

FIGURE 7: DEVELOPMENT OF PHARMACEUTICAL SHARE PRICES 2016



Sources: Bloomberg, KPMG Analysis

PATENT CLIFF DRIVING M&A

In 2016, big pharma engaged in strategic additions to their pipelines, aiming to stabilize growth despite patent expirations. A total of around \$250 billion sales are at risk between 2016 and 2022. For example, AbbVie's Humira, the currently top-selling drug in the world, is likely to be impeded by various biosimilars. The FDA accepted a biosimilar application by Amgen. Merck & Co and Pfizer are also developing similar treatments.

Patent expiries also drive generics. From October 2015 to September 2016, the FDA received 60% more Abbreviated New Drug applications for generics compared to the previous year. Generics sales are expected to rise from \$80 billion in 2016 to \$103 billion in 2020 as these replace the original drugs. For example, Pfizer lost exclusivity for Lipitor in 2011, one of the best-selling drugs of all time. Lipitor's annual sales plunged from \$11 billion pre patent loss to \$2 billion in 2015.

GENERICS





















In 2016, Teva Pharmaceutical Industries Ltd. led the consolidation in generics by acquiring Allergan PLC's generic drug business for \$40.5 billion, solidifying its global leadership. As a precondition, the FDA requires Teva to sell over 75 drugs. The European Commission has requested several divestments including Actavis PLC's British and Irish subsidiaries, which were part of Allergan's purchase of Actavis. Accord Healthcare Ltd. agreed to acquire the latter.

Pharmaceuticals

The deal value of the global top 10
completed deals in 2016 was

\$124.4 billion





















TABLE 1: GLOBAL TOP DEALS COMPLETED IN 2016

BIDDER	TARGET	THERAPY AREA	VALUE ¹	CONTINGENT PAYMENTS ¹	TOTAL VALUE ¹
 Teva Pharmaceutical Industries Ltd.	 Allergan PLC – generic drug business	Generics (wide range of therapeutic areas)			40.5
 Shire PLC	 Baxalta Inc.	Hematology, immunology, oncology			32.0
 Pfizer Inc.	 Medivation Inc.	Oncology			14.0
 AbbVie Inc.	 Stemcentrx Inc.	Oncology	5.8	4.0	9.8
 Mylan N.V.	 Meda AB	Prescription and OTC (respiratory, pain, dermatology)			7.2
 Shire PLC	 Dyax Corp.	Rare diseases	5.9	0.6	6.5
 Pfizer Inc.	 Anacor Pharmaceuticals Inc.	Dermatology			5.2
 AstraZeneca PLC	 Acerta Pharma BV (55%)	Oncology			4.0
 ViiV Healthcare Ltd.	 Bristol-Myers Squibb – HIV portfolio	HIV	0.4	2.5	2.9
 Teva Pharmaceutical Industries Ltd.	 Representaciones e Investigaciones Medicas S.A. de C.V. (Rimsa Laboratorios)	Generics (wide range of therapeutic areas – pain, respiratory, gastro-intestinal)			2.3

The deal value of the global top 10
announced deals in 2016 was

\$24.4 billion

TABLE 2: GLOBAL TOP DEALS ANNOUNCED IN 2016, YET TO CLOSE

BIDDER	TARGET	THERAPY AREA	DEAL STATUS	TOTAL VALUE ¹
 Abbott Laboratories	 Alere Inc.	Infectious diseases, toxicology	Abbott has filed a complaint seeking to terminate the deal	5.8
 Lonza Group AG	 Capsugel SA (KKR & Co. L.P.)	Oral dosage delivery technologies	Pending antitrust approval	5.5
 New Huadu Industrial Group Co., Ltd.	 Yunnan Baiyao Holding Co. Ltd. (50%)	Traditional Chinese medicine (wide range of therapeutic areas)	Pending	3.6
 Allergan PLC	 LifeCell Corp. (part of Acelity L.P. Inc.)	Regenerative tissues	Pending antitrust approval	2.9
 Fujifilm Corp.	 Wako Pure Chemical Industries, Ltd. (part of Takeda Pharmaceutical Co., Ltd., 69%)	Clinical diagnostic reagents, laboratory chemicals	Pending shareholder and antitrust approval	1.3
 Chongqing Jianfeng Chemical Co., Ltd.	 Chongqing Pharmaceutical Group Co., Ltd.	Drug distribution (wide range of therapeutic areas)	Pending	1.3
 Shanghai Fosun Pharmaceutical (Group) Co., Ltd.	 Gland Pharma Ltd.	Generic injectables	Pending	1.3
 ICU Medical Inc.	 Pfizer Inc. – infusion therapy business	Injectables and infusion technologies	Pending antitrust approval	1.0
 Elanco Animal Health Inc. (part of Eli Lilly and Company)	 C.H. Boehringer Sohn AG & Co. KG – certain animal health vaccines	Animal health	Pending antitrust approval	0.9
 Chiesi Farmaceutici S.p.A.	 The Medicines Co. – cardiovascular assets	Cardiovascular	Pending antitrust approval	0.8

¹ All numbers are in US\$ billion. Financial investors are italicized. Figures in green are estimated values.

Sources: Thomson One, KPMG Analysis

Chemicals

The deal value of the global top 10
completed deals in 2016 was

\$34.7 billion


















TABLE 3: GLOBAL TOP DEALS COMPLETED IN 2016

BIDDER	TARGET	BUSINESS AREA	TOTAL VALUE ¹
 Air Liquide SA	 Airgas Inc.	Industrial gases	13.4
 Westlake Chemical Corp.	 Axiall Corp.	Chlorovinyls, vinyl building products and aromatics	3.8
 BASF SE	 Chemetall GmbH (part of Albemarle Corp.)	Surface treatment	3.2
 CHS Inc.	 CF Industries Nitrogen LLC (11%)	Nitrogenous fertilizers	2.8
 Dalian Rubber & Plastics Machinery Co., Ltd.	 Jiangsu Hengli Chemical Fibre Co., Ltd.	Chemical fibres	2.8
 Lotte Chemical Corp.	 Samsung SDI Co., Ltd. – Chemical business (90%)	Plastics (ABS, PC)	2.0
 CMOC Ltd. (part of China Molybdenum Co., Ltd.)	 Anglo American PLC – Niobium and phosphates business	Niobium and phosphates	1.7
 WL Ross Sponsor LLC	 Nexeo Solutions Holdings, LLC (TPG Capital, 65%)	Chemicals and plastics distribution	1.7
 Dmitry Lobyak	 PJSC Uralkali (part of Onexim Group Ltd., 20%)	Potash	1.7
 Jingyuan Holding Co., Ltd.	 Golmud Possession Grid Potash Co., Ltd.	Potash	1.6

The deal value of the global top 10
announced deals in 2016 was

\$181.9 billion

TABLE 4: GLOBAL TOP DEALS ANNOUNCED IN 2016, YET TO CLOSE

BIDDER	TARGET	BUSINESS AREA	DEAL STATUS	TOTAL VALUE ¹
 Bayer AG	 Monsanto Co.	Agrochemicals	Pending antitrust approval	66.0
 China National Chemical Corp.	 Syngenta AG	Agrochemicals	Pending antitrust approval	43.0
 Praxair Inc.	 Linde AG	Industrial gases	Pending approval to create merged group with combined market capitalisation of \$65 bn.	35.2
 Potash Corp of Saskatchewan Inc.	 Agrium Inc.	Fertilizers, agrochemical retail	Pending antitrust approval	13.1
 Sherwin-Williams Co.	 Valspar Corp.	Paintings and coatings	Pending antitrust approval	11.3
 Evonik Industries AG	 Air Products & Chemicals Inc. – performance materials operations	Performance materials	Pending antitrust approval	3.8
 Carlyle Group LP	 Atotech B.V. (part of Total SA)	Plating chemicals and surface treatment	Pending antitrust approval	3.2
 The Mosaic Co.	 Vale SA – fertilizers business	Fertilizers	Pending antitrust approval	2.8
 Lanxess AG	 Chemtura Corp.	Lubricant and flame retardant additives	Pending shareholder and antitrust approval	2.4
 Blackstone Group LP	 Solvay Acetow GmbH (part of Solvay SA)	Cellulose acetate	Pending antitrust approval	1.1

¹ All numbers are in US\$ billion. Financial investors are italicized. Figures in blue are estimated values.

Sources: Thomson One, KPMG Analysis

Chemicals

Chemicals M&A witnessed a solid deal flow in 2016. The number of completed deals decreased slightly by 4% year-on-year. However, the top 10 announcements surpassed \$180 billion. Deals spread across the entire value-chain with a focus on agrochemicals. Strategic investments constituted the majority of deals. PE activity was subdued due to high valuations. US and China were the most active countries.

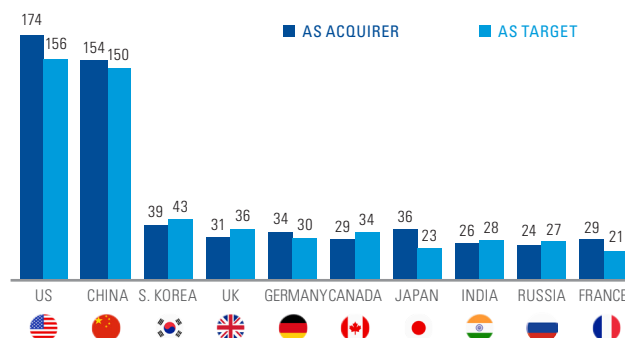
DEAL FOCUS AREAS

The three emerging landmark deals in agrochemicals dominated the sector. The shareholders of Monsanto Co. backed the \$66 billion acquisition by Bayer AG. The deal thus progresses towards regulatory approvals. Meanwhile, Monsanto acquired VitalFields, an Estonian farm management software firm. Both Monsanto as well as Bayer are investing in digital service offerings for farmers.

The merger of Dow Chemical Co. and E. I. du Pont de Nemours and Co. remains under review by global antitrust authorities. The companies, with a combined market capitalization of around \$130 billion, have leading positions in agrochemicals and are major suppliers of specialty polyolefins used in packaging and adhesives.

The \$43 billion acquisition of Syngenta AG by China National Chemical Corp. took a leap forward as it won US CFIUS approval. The last major hurdle for the deal is the European Commission.

FIGURE 9: TOP COUNTRIES IN CHEMICALS M&A 2016



Sources: Thomson One, KPMG Analysis

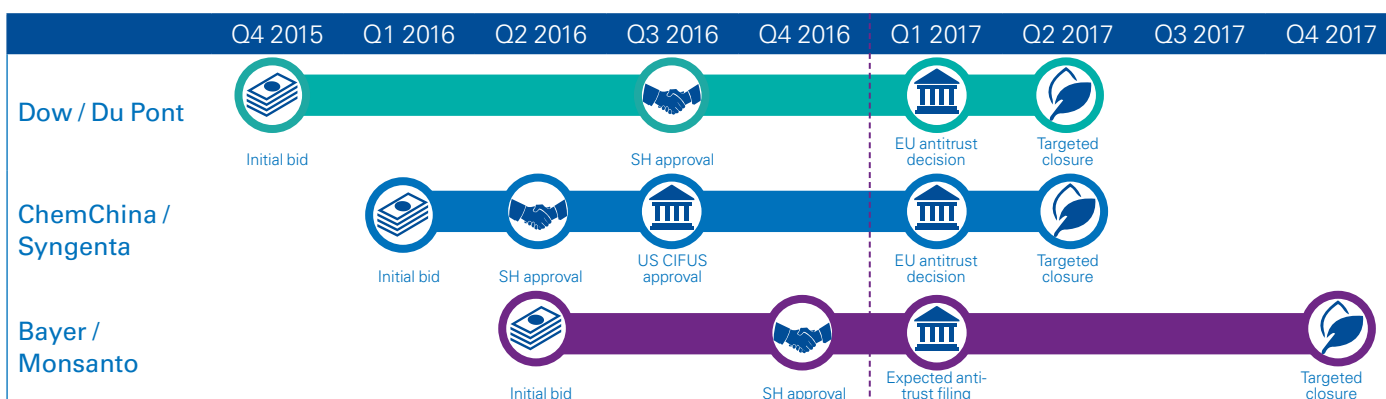
GERMAN AND ASIAN ACTIVITY SURGING

Germany's leading chemical companies were very active in 2016. In total, they plan to invest around \$76 billion. BASF SE, Lanxess AG and Evonik Industries AG all snapped up high margin specialty businesses.

Linde AG announced its intention to merge with US rival Praxair Inc. The deal would create the world's largest industrial gases supplier with pro forma revenues of \$30 billion. Both companies possess complementary strengths and regional footprints. The deal is expected to create annual synergies of \$1 billion.

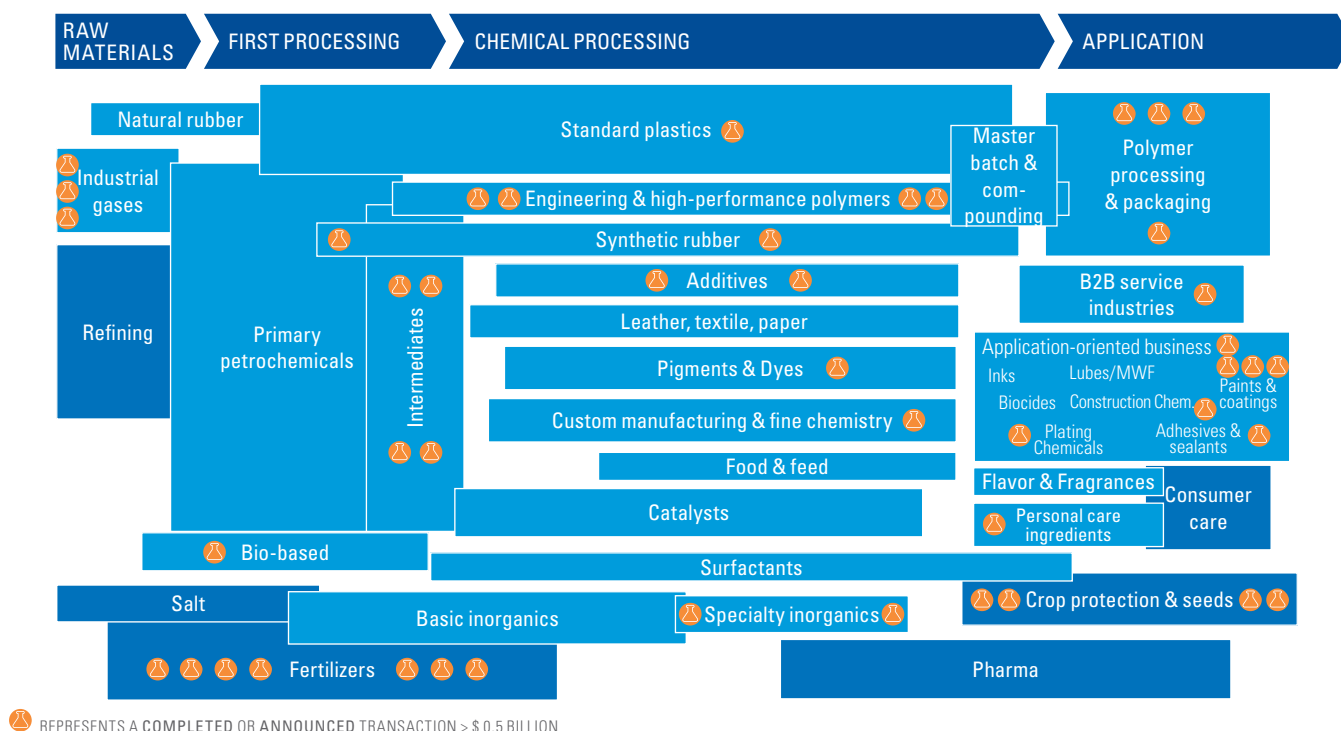
2016 experienced strong deal momentum in Asia. Chinese firms accounted for 21% of total acquisitions, up from 16% last year. Chinese acquirers look for outbound targets in response to domestic market consolidation and cooling economic growth in China.

FIGURE 8: MILESTONES ON PATH TO COMPLETION: TOP AGROCHEMS TRANSACTIONS



Sources: EuroChem MCC, KPMG Analysis

FIGURE 10: CHEMICAL DEALS ALONG THE VALUE CHAIN IN 2016



FINANCIAL INVESTORS

Activity by financial investors was comparably low in 2016. The number of completed PE acquisitions declined by 17% year-on-year. High valuations made it difficult for financial investors to find attractive targets. However, a series of PE investors exited the sector with four deals worth more than \$1 billion each.

Activity finally gained pace in Q4 2016 as Carlyle Group LP announced the acquisition of Atotech, the specialty chemicals unit of Total SA, for \$3.2 billion. The French oil giant was seeking buyers for Atotech, as it plans to divest non-core assets in response to declining oil prices.

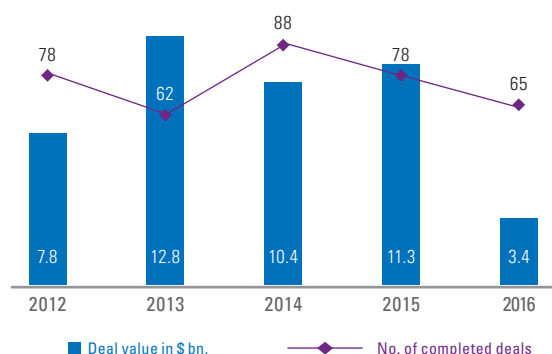
It is Carlyle's second largest acquisition of a chemical company in recent years after buying Axalta Coating Systems Ltd. from DuPont for \$4.9 billion in 2013.

Blackstone Group L.P. announced its acquisition of the German-based cellulose acetate tow business from Solvay S.A. It is Solvay's fourth divestiture in 2016 and part of its portfolio reshaping strategy.

CAPITAL INDEX

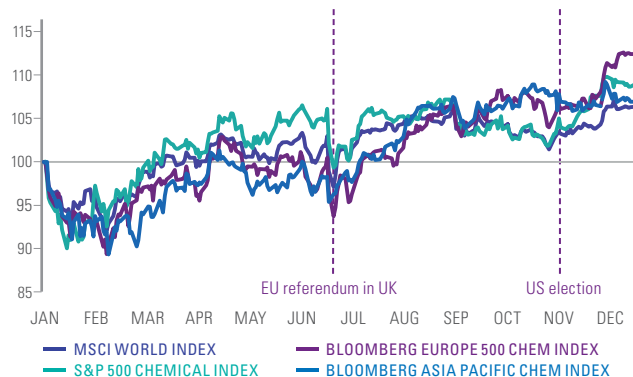
Following a decline at the beginning of the year, chemical indices rose steadily throughout 2016. Despite the EU referendum in the UK, Bloomberg Europe 500 (+15.8%) outperformed other regional indices.

FIGURE 11: CHEMICALS ACQUISITIONS BY PRIVATE EQUITY



Sources: Mergermarket, KPMG Analysis

FIGURE 12: DEVELOPMENT OF CHEMICAL SHARE PRICES 2016



Sources: Bloomberg, KPMG Analysis

BASIS OF DATA PREPARATION

Values and volumes used throughout the report are based on completion date as provided by Thomson Reuters' database Thomson One as of 31 December 2016, extracted up to and including 03 January 2017, and supplemented by additional independent research. Data available after publication date is incorporated in subsequent editions. This edition presents revised data for the years 2010 to 2015. 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:

Pharmaceuticals

- Medicinal chemicals & botanical products
- Pharmaceutical preparations
- In vitro and in vivo diagnostic substances
- Biotechnology – biological products, except diagnostic substances
- Pharmaceutical wholesale

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 pharmaceutical sector, this comprises 194 public companies. For the chemical sector, this comprises 192 public companies.

All figures in this report are shown in US Dollars (\$) unless otherwise stated.

Sources

Online databases:

- Thomson One (Thomson Reuters)
- Mergermarket
- S&P Capital IQ
- Bloomberg
- EvaluatePharma

Publications

- Various companies' press releases

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