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Asia's Chemical Distribution Market: The final Frontier for Mergers and Acquisitions!

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ABSTRACT

The chemical distribution business had undergone huge transformational changes globally, through mergers and acquisitions, by both strategic buyers and private equity firms. The industry consolidation process in Europe and North America which started many years ago is now being shifted to Asia. There is very little research being done on Asia's chemical distribution market size and the major chemical distributors. Asia's chemical industry enjoyed tremendously high growth in the past years, and coupled with the highly fragmented chemical marketplace, it offers huge scope for consolidation. The lack of information and clarity in Asia's chemical distribution sector has somewhat impeded the pace of the consolidation process. A clearer knowledge of the chemical distribution market size, and the key players in the market, itself would help potential investors enormously in their decision making to expedite the mergers and acquisitions process. The research findings can serve as a compass for potential investors to navigate through Asia when searching out for potential targets and would offer investors a much-needed informational tool to know where to look to invest in. Literature review on existing publications, chemical industry trade publications, and chemical distribution associations will provide the background information for this research.

Key words search: Chemicals, Chemical Distribution, Chemical Distributors, and Chemical Distribution Market Size.

INTRODUCTION

The global chemical sales, and the chemical distribution market size, in 2019, are valued at about €3,700 bn and €260 bn, respectively, and both are still growing very strongly. Due to the shifting dynamics of countries developments, the proportion of product mix of commodity to specialty chemicals are also changing over time and regions. This research first focuses on the market size for the global chemical sales for the various regions identified, and this was then used to approximate the chemical distribution market size. Going deeper into the research, the commodity and specialty chemical distribution market sizes were also forecasted. A literature review is conducted to understand what had been established for the current forecasted global chemical sales as a starting point for this research. The Author will also provide his own forecast of the chemical distribution market size, for both commodity and specialty chemical sectors. In this research, the focus is on Asia and the main chemical distributors (CDs) will be mapped out for three out of the four categories, namely Global, Regional-Foreign and Regional-Local. The fourth category, Local-Local CDs group, will not be analyzed here as too many of these CDs' sales revenues are not known publicly.

The findings of the research will provide greater clarity to the chemical distribution business in Asia, and this can potentially help to spur on more mergers and acquisitions (M&A). The consolidation of the chemical distribution industry would favour the early movers who are able to have the pick of the better positioned regional CDs. This will give them the first mover advantage to entrench themselves deeper into the chemical distribution industry by being able to selectively direct their investments into the many attractive Asian CDs. Having more clarity in the industry will also attract global CDs, who are not operating here yet, or have little exposure in Asia, to expand into Asia as part of their global expansion strategy.

GLOBAL CHEMICAL SALES

The Author had published a number of research papers over the years on the topic of chemical distribution and chemical distributors (CDs), ranging from disintermediation of CDs through e-B2B (Tay & Chelliah, 2010), Private Equity (PE) firms acquiring CDs (Tay & Chelliah, 2013), PE firms' exit strategies for CDs through SBOs & IPOs (Tay, 2018a), valuation of CDs using comparable metrics and precedent transactions (Tay, 2018b), valuation of CDs using Discounted Cash Flow method (Tay, 2018c), and, the shifting dynamics of the chemical distribution business due to M&A in South East Asia (Tay, 2019). Tay (2019) had conveniently divided the CDs into four categories, namely, Global, Regional-Foreign Owned, Regional-Local Owned and Local-Local owned CDs.

Before approaching the topic on Asia's chemical distribution market size, the Author will have to take a step backward to first investigate the global chemical sales for each of the geographical region. The Gross Domestic Product (GDP) of countries, and the chemical sales, has a bearing on the chemical distribution market size. However, not all chemical sales require the intermediation of CDs, and it is generally recognized that the majority portion of the chemical sales does not require any intermediation at all. This information will provide a baseline for forecasting the chemicals sales, and then provide a basis in determining the ceiling level of the chemical distribution market size forecast. Tay (2019) had already provided a forecast on the global chemical sales and the chemical distribution market size. Since then, a couple of years has gone by and the forecast will be re-look into and the forecasted market size will be updated to reflect the market in 2020, or at least until 2019, wherever data are available.

In addition to the numerous fee-based research companies providing data on the global chemical sales, Cefic (2021a) provided the most detail information for the main geographical regions in the world. Cefic (2021a) is the European chemical industry council and is the main European trade association for the chemical industry. They are a not-for-profit organization which represents 29,000 large, medium, and small chemical companies in Europe and act as the conduit between members with international and European institutions, non-governmental organisations, the international media, and other stakeholders. The Author relies heavily on the world chemical sales by geographical regions provided by Cefic (2021b) in building up the chemical distribution market forecasting model. For simplicity, all the values are stated in € and the exchange rate of €1 to US$1.12 is applied throughout.

Table 1 shows the estimated world chemical sales from 2012 to 2019 and, includes the forecasted sales for 2020 and 2030 (Cefic, 2021b). It forecasted the world chemical sales to be worth €4,000 bn by the year 2020. The Cefic's world chemical sales figure differs from Market

Research (2020) forecast by about 7.0% for 2019 (Table 1). Cefic's world chemical sales forecast of €4,000 bn by 2020 is probably not going to be met as the world chemical sales has only reach €3,669 bn by 2019. With a compound annual growth rate (CAGR) of 4%, the world chemical sales for 2020 is probably going to reach about €3,820 bn only, which is about 8.0% lower than the forecasted figure. Looking forward even further, if the CAGR continues to grow at 4.0%, then the 2030 forecasted chemical sales of €6,300 bn is also probably not going to be met.

Table 1: World Chemical Sales

Year	World Chemical Sales	Reference
2012	€2,560 bn	Cefic (2016)
2015	€3,534 bn	Cefic (2016)
2017	€3,763 bn	Market Research (2018) 2013 to 2017 - CAGR 2.7%. Commodity segment €1,900 bn (est. 50.5%)
	€3,475 bn	Cefic (2021b)
2018	€3,525 bn	Cefic (2021b)
2019	€3,922 bn	Market Research (2020) 2015 to 2019 - CAGR of 3.0% Commodity Segment €2,000 bn (est. 50.8%)
	€3,669 bn	Cefic (2021b) 2009 to 2019 - CAGR of 4.1%
2020	€4,000 bn	Cefic (2010) (forecasted)
2030	€6,300 bn	Cefic (2021b) (forecasted)

Sources: Partially extracted from Tay (2018a, p. 81), Cefic (2010; 2016; 2021b) & Market Research (2018; 2020).

Notes:

Exchange rate €1 = US$ 1.12 was used throughout;

CAGR - Compound Annual Growth Rate.

Table 2 shows the world chemicals sales for the year 2012, 2013, 2015, 2017, 2019 and 2030 forecasted by Cefic (2021b). The key regions defined are Europe, North America, Latin America, Asia and the rest of the world. The rest of the world left is essentially Middle East and Africa and will be labelled as such here. The world chemical sales were valued at €3,127 bn for 2012 and, will reach €6,300 bn by 2030. By 2019, Asia already occupies 61% of the world chemical sales, and is forecasted to be at almost 65.0% of the world chemical sales by 2030.

Table 2: World Chemical Sales by Geographical Regions

	2012 €3,127 bn	2013 €3,200 bn	2015 €3,534 bn	2017 €3,475 bn	2019 €3,699 bn	2030 (Forecast) €6,300 bn
North America	**526**	**534**	**580**	**519**	**570**	**882**
Europe	**673**	**640**	**614**	**654**	**711**	**964**
EU27	558	534	519	542	543	756
Rest of Europe	115	106	95	112	168	208
Latin America	**144**	**147**	**134**	**109**	**117**	**315**
Asia	**1,724**	**1,837**	**2,160**	**2,137**	**2,229**	**4,070**
China	952	1,062	1,410	1,293	1,488	2,772
India		72	78	101	92	
Japan	176	154	138	154	168	252
South Korea	124	132	113	112	119	
Rest of Asia	472	621	421	477	362	1,046
Middle East & Africa	**60**	**42**	**46**	**48**	**26**	**69**

Source: Cefic

Note: EU27 – the European Union in 2013, when it had 27 countries

For the period 2013 to 2019, the CAGRs for North America, Europe and Asia were at 1.0%, 1.7% and 3.3%, respectively. Cefic has forecasted the CAGRs for the period 2019 to 2030 for North America, Europe, and Asia to be at 4.0%, 2.8% and 5.6%, respectively. These are probably slightly optimistic forecast on the growth rates for the three regions over this period. The Author would suggest using lower growth rates for this research. Using a composite CAGR of 2.0% to 3.0% for more mature regions like Europe and North America, and 3.0% to 4.0% for faster growing economies like Asia and, Middle East and Africa, the Author forecasted the world chemicals sales to be valued at €6,050 bn by 2030, which the Author would adopt later on.

World Chemical Sales – Commodity and Specialty Chemicals

Chemical products can be broadly divided into commodity and specialty chemicals. There are many interpretations on what constitute specialty and commodity chemicals and there are no universal definitions to divide the two. Some define commodity chemicals as low-price chemical being sold in large volumes, whereas others tried to define them by the industrial segments that the products are being sold to. There were also others who tried to define what specialty chemical are, and as for the rest of it, they are just simply labelled as commodity chemicals.

The American Chemistry Council (ACC, 2021) tried to describe a specialty chemical by what it does rather than by its chemistry. It describes specialty chemicals as "*performance chemicals*" which are differentiated, and often technologically advanced products. They further described them as being manufactured in lower volumes than commodity chemicals and are used for a specific purpose, for example, as a functional ingredient or as processing aids in the manufacture of a diverse range of chemical products. Specialty chemicals are generally used in the manufacture of adhesives, sealants, catalysts, coatings, electronic chemicals, institutional

and industrial cleaners, plastic additives and water management. Specialty chemicals tend to incorporate some level of customer-servicing or technical-servicing component.

Commodity chemicals make up the majority of the production volume in the global chemical marketplace. They are also known as base chemical, and they cover the petrochemical products and its derivatives, polymers, plastics, and basic inorganic chemical products. These products are sold to the paint, ink, dyes and pigments, crop protection, water treatment, and electronics industrial sectors. Cefic (2021b) has used the word "*Base*" chemicals to cover the commodity chemicals. In Europe, commodity chemicals make up 59.0% of the European chemical sales (Cefic, 2021b) for 2019, and specialty chemicals represents about 26.2% of the sales.

Cefic (2021b) has categorized a sector called "*consumer chemicals*" where these products are sold to the soap, detergents, perfumes, and cosmetics consumers. This group takes up 14.9% of the European total chemical sales for 2019. This group of consumer products uses many different types of chemicals to formulate the final consumer products. This group of chemical products qualifies to be classified into the specialty chemical sector. In this research, it will be combined into the specialty chemical grouping, which takes the specialty chemical group total sales for 2019 in Europe to 41.1%.

In the European Union, commodity chemicals make up of 58.5%, 60.4% and 58.9% of the chemical sales for the year 2017, 2018 and 2019 (Cefic, 2021b), respectively. The specialty (including the consumer chemicals) makes up the balance 41.5%, 39.6% and 41.1% of the chemical sales for the respective year. On average, the commodity to specialty chemicals sales was at 60/40 split, over the period 2017 to 2019. For these three years, the 60/40 split between commodity and specialty chemicals do not seem to vary that much year to year, and, so the Author has taken the 60/40 split as guidance for the European market. The European chemical market is already quite mature, and it is expected to continue as such for the foreseeable years ahead. North America too, is a mature economy, and the chemical sales split between commodity and specialty chemicals is probably not much different than that of Europe. The Author has conveniently chosen the commodity to specialty chemicals split for North America to be the same for Europe, which is 60/40 split.

Many of the countries in the Asia region are developing countries and it is expected that their chemical requirements will consist of higher proportion of commodity chemicals than specialty chemicals. There is insufficient publicly available data to provide a definitive percentage split between commodity and specialty chemicals in Asia's sales. However, it would be intuitive to forecast that the requirements for commodity chemicals will be higher than specialty chemicals for developing countries like Asia. The Author has forecasted the commodity chemicals to specialty chemicals split to be 65/35 for developing countries and that would be a reasonable starting point to consider for Asia, Latin America, and Middle East and Africa. However, with the growing industrialization of these regions the proportion of commodity to specialty chemicals requirements are expected to change going into the future. For the 2030 forecast, the commodity chemicals to specialty chemicals percentage split for Asia, Latin American and Middle East and Africa was forecasted to be 60/40, which will make it to be the same for the developed countries of Europe and North America. This is purely an assumption adopted by the Author.

Figure 1 shows the chemical sales by the regions, for both commodity and specialty chemicals, for 2019 and, also the forecasted 2030 chemical sales. Earlier on, the Author has elaborated that the 2030 forecasted world chemical sales of €6,300 bn by Cefic (2021b) was probably a bit overly optimistic and believed that €6,050 bn would be more achievable and this is included into Figure 1 to show the comparison.

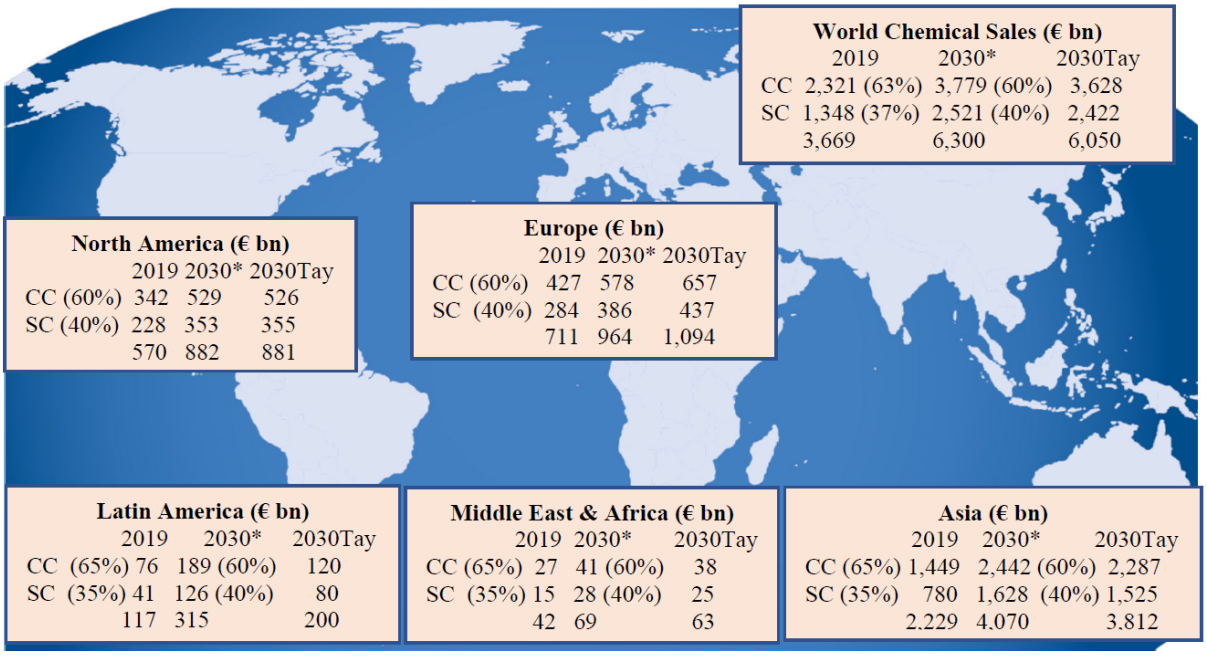


Figure 1: World Chemical Sales for 2019 & 2030 (Commodity & Specialty Chemicals)
Sources: 2019 and 2030* figures were extracted from Cefic (2021b) and figures for 2030Tay was forecasted by Author.
Notes:
CC = Commodity Chemicals, and SC = Specialty Chemicals;
The percentage ratio split of commodity to specialty chemicals were estimated by the Author; and
World Map is from VECTOR.ME

With the commodity to specialty chemicals 60/40 split for the developed regions, and 65/35 split for developing regions, this has resulted in the total global commodity to specialty chemicals sales split of 63/37 for 2019 (Figure 1). With the commodity to specialty chemicals split of 60/40 for 2030, and with the forecasted world chemical sales at €6,050 bn, the breakdown for commodity and specialty chemicals sales would work out to be about €3,630 bn and €2,420 bn, respectively. By 2030, the chemical sales for Asia will reach €3,812 bn, consisting of commodity and specialty chemicals at €2,287 bn and €1,525 bn, respectively. Asia's CAGR for the period 2019 to 2030 was forecasted to be 5.0% by the Author, and it is higher than the global chemical sales CAGR of 4.6%. This would be logical given that Asia has a higher growth rate than North America and Europe. With the world chemicals sales numbers together with the geographical regions defined, now the research will move downwards to determine the chemical distribution market size for the various regions.

GLOBAL CHEMICAL DISTRIBUTION MARKET

The roles of the commodity and specialty chemical distributors (CDs) will be discussed here to provide a common understanding on the distinctive roles played by the respective distributors. The research will then move on to forecast the chemical distribution market size for each of the regions.

Roles of Chemical Distributors

Tay and Chelliah (2010) conducted an in-depth analysis on the multiple roles of the CDs. CDs are not just simply re-sellers of chemicals, but they add value to both their customers and suppliers by offering many different services (Hornke, 2012; Mortelmans & Reniers, 2012). CDs take titles to the chemicals and warehouse them before selling it without changing the original packaging (Chemagility, 2008, as cited in Lampadarios, 2016). It is quite normal to have a formal distribution agreement between the CD and the product manufacturer/supplier whom they represent, though these days, they are more likely to be on a non-exclusive basis.

Fundamentally, chemical distribution is just to bring the chemical products from the suppliers to the customers at the right time and right price, and this goes the same whether they are commodity or specialty chemicals. The type of chemical products, where to pick up the material from, and, where and when to deliver the products to the customers, will define the roles that are required of the CDs. As Tay and Chelliah (2010) found out that customers do not really care that much who is supplying them the chemicals as long as it is somebody they can trust, have availability of the inventory, deliver the products as and when needed, and at competitive prices.

Commodity Chemical Distributors

The customers' expectations of the commodity CDs are generally relatively simple. Customers expect fast response on enquiries for commodity chemicals, low prices and reliable products availabilities and deliveries. Commodity chemical type customers may not necessarily expect the CDs to have stocks locally so long as the chemical products can be delivered to them as and when needed. In many instances, commodity CDs may not even physically see the products they sell to the customers because the products are shipped directly by the producers/suppliers to the customers' choice of destination. Commodity chemicals like petroleum derivatives (Benzene, Toluene and Xylene) are normally traded this way. In some cases, the commodity CDs may store the chemical products in bulk storage tank facility offered by third-party providers like Stolt-Nielsen (2021) and Vopak (2021). Many commodity CDs do store the chemicals and provide drumming services to their clients.

Specialty Chemical Distributors

The specialty CDs distribution process involves a wide range of activities like logistical support, intermediate product formulation, inventory management, and transportation of chemicals for customers. Some CDs have additional facilities like laboratory, blending equipment, product testing, and product/formulation knowhow. In addition, specialty CDs had to provide competitive and stable product pricings, competent and knowledgeable sales team for technical support and local credit payment terms (Burns, 2010; Hornke, 2012; Mortelmans & Reniers, 2012).

Specialty CDs are almost an extension of the manufacturer's/supplier's own supply chain, and they offer logistical services including product and market intelligence, new product regulatory approvals conforming to local regulations, and arrangement of import authorizations (Jung et al., 2013; Mortelmans & Reniers, 2012). Specialty CDs thus become a vital component of the manufacturers' channel strategies and, specialty CDs who has deep market insights and the capability to create real value will be valued by the manufacturers. Many of the international specialty CDs are no longer just scaling up for the sake of size alone but rather they are making highly targeted acquisitions to fill in portfolio gaps and key capabilities to supplement their own capabilities. This has been one of the key reasons for the global CDs to grow aggressively inorganically in the newer markets like Asia, Latin America and Africa through M&A.

Chemical Distribution Market Size

Jung et al. (2013) had forecasted the chemical distribution market size to be worth €165 bn by 2012. The world chemical sales were reported to be worth €2,560 bn for that period and the chemical distribution market translates to about 6.4% of the world chemical sales. Mahnke et al. (2020) forecasted the chemical distribution market size to be worth €232 bn by 2015 and where the global chemical sales were valued at €3,534 bn (Cefic, 2021b). The chemical distribution market size then translates to about 6.6% of the total chemicals sales. The chemical distribution market sizes relative to the global chemical sales, for both these periods, by Boston Consulting Group (BCG) reports, are quite aligned to each other.

Table 3 shows the summary of the chemical distribution market size for the period 2006 to 2028. It was observed that the chemical distribution market CAGR ranges from 3.0% to 9.0%, with majority of the forecast floating around the 5.0% to 6.0% mark. BCG had previously published articles on the chemical distribution market (Jung, 2012; Jung et al., 2013; Hoffmann et al., 2014; Rothman et al., 2018; & Mahnke et al., 2020). The forecasted chemical distribution market by 2020 ranges from €219 bn to €283 bn and was further forecasted to reach €328 bn by 2028. BCG (Mahnke et al., 2020) had forecasted the chemical distribution market to be valued at €272 bn by 2019.

Table 3: Chemical Distribution Market Size

Year	Market Size	References & Remarks
2006	€89 bn	Ref: Young (2007)
2009	€138 bn	Ref: Jung (2012) BCG
2010	€98 bn	Ref: Chemical Week (2010)
	€117 bn	Ref: Chemagility (2012)
	€155 bn	Ref: Jung (2012) BCG
2011	€121 bn	Ref: Chemagility (2012)
	€164 bn	Ref: Jung (2012) BCG
2012	€165 bn	Ref: Jung et al. (2013)
2013	€168 bn	Ref: Hoffmann et al. (2014) BCG. From 2008 to 2013 CAGR is 6.5%. Chemical distribution market grew 9.1% in 2008 to 9.7% in 2013.
	€202 bn	Ref: QY Research (2018)
2014	€171 bn	Ref: Zion Market Research (2019b)
2015	€210 bn	Ref: Tay (2018a)
	€232 bn	Ref: Mahnke et al. (2020) BCG
2016	€236 bn	Ref: Mahnke et al. (2020) BCG
2017	€190 bn	Ref: QY Research (2018) Chemical distribution market CAGR of 6%.
	€205 bn	Ref: Zion Market Research (2019b) Chemical distribution market CAGR of 5.3% from 2020 to 2027.
	€252 bn	Ref: Mahnke et al. (2020) BCG
	€263 bn	Ref: Mahnke et al. (2020) BCG
	€277 bn	Ref: Zion Market Research (2019a) Chemical distribution market CAGR of 3% from 2019 to 2026.
2019	€248 bn	Ref: Tay (2019)
	€273 bn	Ref: Mahnke et al. (2020) BCG
2020	€219 bn	Ref: Verified Market Research (2021) Chemical distribution market CAGR of 5.29% from 2021 to 2028.
	€227 bn	Ref: Market Study Report (2021)
	€238 bn	Ref: Reports Box (2021)
	€244 bn	Ref: Zion Market Research (2019b)
	€264 bn	Ref: Tay (2019)
	€283 bn	Ref: QY Research (2018)
2025	€300 bn	Ref: Zion Market Research (2019b)
2026	€281 bn	Ref: Market Study Report (2021)
	€351 bn	Ref: Zion Market Research (2019a)
2027	€290 bn	Ref: Reports Box (2021)
	€321 bn	Ref: Data Bridge Market Research (2021)
	€323 bn	Ref: Grand View Research (2020) Chemical distribution market CAGR of 5.3% from 2020 to 2027; Specialty chemicals market CAGR of 5.8% from 2020 to 2027;

	€332 bn	Ref: Zion Market Research (2019b)
2028	€328 bn	Ref: Verified Market Research (2021)

Note: €1 = US$ 1.12 was used consistently throughout.

Tay (2019) had forecasted the chemical distribution market for 2019 and 2020 to be worth about €248 bn and €264 bn, respectively. Tay's (2019) projections would appear to be less optimistic than BCG's (Mahnke et al., 2020) with the difference being about 10%. However, Tay's (2019) projection of the market size of €264 bn for 2020 was on the higher side, except for QY Research (2018), which values it at €283 bn. From 2025 to 2028, the chemical distribution market was forecasted to be around €300-€350 bn range.

Chemicals Distribution Market Size: Commodity and Specialty Chemicals

From the period 2008 through to 2013, BCG (Hoffmann et al., 2014) had forecasted the overall chemical distribution market size to grow to €168 bn by 2013, with a CAGR of 6.5%. By 2013, Hoffmann et al. (2014) had also forecasted the global commodity and specialty chemical distribution market to reach €97 bn and €71 bn, respectively. The North America chemical distribution market was forecasted to be worth about €29 bn with the commodity and specialty chemical to be worth about €18 bn and €11 bn, respectively, by 2013. So, the commodity to specialty chemical distribution market split is 62/38 (Hoffmann et al., 2014). The specialty chemical distribution market is further forecasted to grow to €14 bn by 2018. For Europe, the specialty chemical distribution market size was forecasted to be worth €13 bn out of the total Europe chemical distribution market size of €32 bn. This translates to a commodity to specialty chemical distribution market split of 60/40.

From literature review, it was found there is not much research being conducted on the commodity chemical distribution market. It was estimated that as much as 60% (Grand View Research, 2020) to 70% (Technavio, 2019) of the total chemical distribution market is attributed to commodity chemicals. BCG Chemical Distribution Market Model May 2020 (as cited in Mahnke et al., 2020) and, also being presented in FECC (2021) web page, showed both the commodity and specialty chemical distribution market size for the period 2015 to 2019. FECC (2021) is a European chemical distribution association which promote the chemical distribution industry as value-add-partner, and they represent around 1,600 companies. The commodity chemical distribution market size ranges around 57% to 58% of the chemical distribution market share from 2015 to 2019 and the chemical distribution market grew from €232 bn to €273 bn over this period.

World Chemical Sales Vs Chemical Distribution Market Size

Tay (2018a; 2019) had forecasted the chemical distribution market to grow to €440 bn by 2030, with a CAGR of 6.0%. On hindsight the 6% CAGR considered by Tay (2018a; 2019) would seem to be slightly optimistic. The CAGR of 5.0% would seem to better reflect the chemical distribution market growth rate for the period 2015 to 2030 and the Author has adopted the 5.0% CAGR for forecasting the future chemical distribution market. Table 4 shows the world chemical sales and the forecasted chemical distribution market size for the period 2017, 2019, 2020 and 2030, for the regions of North America, Europe, Asia, Latin America and Middle East & Africa.

Table 4: World Chemical Sales & Chemical Distribution Market Size

Year	World Chemical Sales (€ bn)	Chemical Distribution Market Size (€ bn) (Forecast)		Chemical Distribution Market Size (€ bn)	Chemical Distribution Market Size by Sectors and Regions (€ bn)		
2015	3,534[1]			232*	Commodity	134*	
					Specialty	98*	
						CC	SC
					Europe	26	18
					North America	22	15
					Latin America	5	2.5
					Asia	92	49.5
					Mid East & Africa	1.5	0.5
		Pro-rated	5% CAGR	Average			
2017	3,475[1]	228	256	242	242		
2019	3,699[1]	243	282	262	Commodity (63%)	165	
					Specialty (37%)	97	
						CC	SC
					Europe	32	18
					North America	26.5	15.5
					Latin America	5	3
					Asia	100	60
					Mid East & Africa	1.5	0.5
2020	3,884	255	296	276	Commodity (63%)	173.5	
					Specialty (37%)	102.5	
						CC	SC
					Europe	33	20
					North America	27	16.5
					Latin America	5.5	3
					Asia	106	62
					Mid East & Africa	2	1
2030	6,050	397	482	440	Commodity (60%)	264	
					Specialty (40%)	176	
						CC	SC
					Europe	50	33
					North America	42	28
					Latin America	8	6
					Asia	161	107
					Mid East & Africa	3	2

Notes:
CC = Commodity Chemicals; and SC = Specialty Chemicals;
2015 is used as a reference year for pro-rating the future chemical distribution market size;
Figures 232*, 134* & 98* for year 2015 were extracted from Mahnke et al. (2020);
Figures with [1] were extracted from Cefic (2021b);

By 2030, it was forecasted that the split of commodity to specialty chemicals has changed to 60/40 from the split of 63/37 which was applied to 2019;
All other figures were forecasted by the Author.

Tay (2019) had based his market forecasting using the 2102 chemical distribution market size put forward by BCG as the starting point. Since then, BCG have more up-to-date chemical distribution market data, and so the 2015 figures were used as a starting point in forecasting, and pro-rating, the later years' chemical distribution market size. The forecasting based on the global chemicals sales against the chemical distribution market was conducted in three steps. Firstly, the chemical distribution market size was forecasted based on pro-rating the world chemical sales against the 2015 base figure. For example, for 2019, the chemical distribution market size forecast based on pro-rated method valued it as €242 bn (3,699/3,534 x 232). Secondly, the chemical distribution market size based on the CAGR of 5.0%, starting from the 2015 market size of €232 bn, valued the market size at €282 bn by 2019. Thirdly, the chemical distribution market size for 2019 of €262 bn was arrived at based on the average of the two forecasted figures of €242 bn and €282 bn. The chemical distribution market size forecasted for 2020 and 2030 was also based on this method. Forecasting was also done on the commodity and specialty chemical distribution market size based on the commodity to specialty distribution chemical percentage split for the region (Table 4). By 2020, the global chemical distribution market had grown to €276 bn and, is expected to grow further to €440 bn by 2030 from the Author's projection.

Table 5 shows the chemical distribution market size as a percentage of the chemical sales and the Gross Domestic Product (GDP) of the regions identified. GDP is the total market value of all the finished goods and services produced within a country over a specific time period (World Bank, 2021). It is a broad measure of the overall domestic production, and it serve as a good indicator of a given country's economic health. The chemical sales into a country are highly related to the GDP of the country as generally a high consumption country i.e., wealthier nations are bigger consumers than a poorer country. GDP figures could be obtained from various international organizations, like United Nations (UN), Organisation for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF). The Author has chosen to use data provided by the World Bank (Knoema, 2021) as their data are more complete for all the relevant countries. It was observed that there were about 5% discrepancies on the GDP figures between these various authorities for the particular year. The global GDP for 2012, 2015 and 2019 from the World Bank amounted to €55.5 trillion, €63.5 trillion and €73.8 trillion, respectively (Knoema, 2021).

Table 5: Chemical Distribution Market Size, Chemical Sales & GDP

	Chemical Distribution Market Size (€ bn)		Chemical Distribution Market Size/Chemical Sales (%)		Chemical Distribution Market Size/GDP (%)	
	2015*	**2019**	**2015**	**2019**	**2015**	**2019**
Asia	**141.5**	**160.0**	**6.6**	**7.2**	**0.67**	**0.61**
Europe	**44.0**	**50.0**	**7.2**	**7.0**	**0.25**	**0.26**
North America	**37.0**	**42.0**	**6.4**	**7.4**	**0.21**	**0.20**
Latin America	7.5	8.0	5.6	6.8	0.18	0.19
Middle East & Africa	2.0	2.0	4.3	7.7	0.07	0.06
Total	**232***	**262**	**6.5**	**7.1**	**0.36**	**0.35**

Notes: From Author for this research except for data indicated.
*** Data extracted from Mahnke et al. (2020);**
Chemical Sales data for 2015 & 2019 were extracted from Table 4;
Gross Domestic Product (GDP) nominal (Current Year US$) data was from the World Bank (Knoema, 2021);
Year 2020 World Chemical Sales data are not available yet and so 2019 data was used;
€1 = US$ 1.12 was used throughout.
Latin America, and, Middle East & Africa chemical sales and distribution market size data are not well grounded yet, and so, the results presented here should be used with caution.

For 2019, the chemical distribution market size ranges around 6.8% - 7.7% of the chemical sales for the five regions and, overall averages out to be 7.1% of the global chemical sales (Table 5). The percentage of chemical distribution market size to chemical sales for Asia, Europe and North America was 7.2%, 7.0% and 7.4%, respectively. They would seem to indicate agreement for the three regions, as well as in comparison to the global chemical sales which averages out to be 7.1%.

Chemical distribution market size for 2019 averages out to be 0.35% of GDP, with Asia having the highest percentage at 0.61%. Europe and North America chemical distribution market size averages out to be at 0.26% and 0.20% of GDP, respectively. These percentage do however appear to be in-line with the percentages for 2015 for all the three regions. The percentages for Europe and North America for 2015 and 2019 were also observed to remain quite steady over the period whereas Asia was observed to be trending slightly lower for 2019. This may be due to the Asia's GDP growing faster than the chemical distribution market over this period.

Jung et al. (2013) had in 2012 made similar comparisons, where the chemical distribution market size to global chemical consumption was recorded at 6.5%. Asia, Europe and North America percentage were at 5.0%, 7.6% and 7.7%, respectively for 2012. From Table 5, the percentage for year 2019 is at 7.1%, showing an increasing chemical distribution market. Jung et al. (2013) also made references to the distribution market size to the GDPs of the five regions. Overall chemical distribution market size works out to be about 0.30% of GDP for 2012. The percentage derived by Jung et al. (2013) were not much different than those derived by the Author for year 2015 and 2019.

The chemical distribution market size relative to the chemical sales and GDP data presented in Table 5 are only meant to show as a guide on the chemical distribution market size relative to the chemical sales and GDP for the various regions. Anyone trying to use the data to reverse-estimate the market distribution market size from the chemical sales and GDP should use it with caution.

Asia's Chemical Distribution Market: The Final Frontier for M&A

From Table 4 we can see that Asia's chemical distribution market size is about 61% of the global market size. The commodity to specialty chemical market size split for 2015 was at 65/35 and this has moved towards 60/40 by 2030. This split would converge with the split for Europe and North America of today. The Author forecast that beyond 2030, Asia's chemical distribution market size would probably not be growing as much as it did in the prior years as Asia would also be moving towards being a mature market line Europe and North America.

This tremendously high growth rate of the chemical distribution business has attracted a lot of foreign investments into Asia, notably from the global CDs (Brenntag, IMCD, Barentz, Azelis and Caldic). Brenntag (2021) was the early investor into Asia's chemical distribution businesses. In 2007, Brenntag took over Rhodia's chemical businesses in Australia, India, Taiwan, and South East Asia. This marked the entry of Brenntag into Asia chemical distribution business. Brenntag then followed by acquiring EAC Industrial Ingredients in 2008, and then in 2011, acquiring Zhong Yung Chemical in China. With this, Brenntag has gained a strategic market foothold into the chemical distribution business in China. Other Global CDs, like IMCD (2021) and Azelis (2021), also followed to invest into Asia. These Global CDs had injected tremendous amount of excitement into Asia's chemical distribution business, which otherwise was just a normal day-to-day business being serviced by the Regional-Local and Local-Local CDs in the past. These Global CDs have added in new dimensions to the chemical distribution business by consolidating a part of the market sector. Major M&A activities had taken place in North America and Europe for many years and though it has not reach saturation level yet, but the M&A activities has certainly slowed down in the more mature economies. This has help Asia tremendously as a lot of the focus of M&A are now switched to Asia. Is Asia going to be the final frontier for the chemical distribution business? Only time will tell as the Author believed that there is still a good ten years ahead of consolidations to take place before they will reach saturation level. With Asia chemical distribution market sizes of €168 bn and €268 bn for 2020 and 2030, respectively, this provides huge scope for industry consolidation through M&A. Any data and commercial information on chemical distribution market and CDs in Asia would greatly expedite the M&A process and help to provide an impetus for consolidation.

TOP CHEMICAL DISTRIBUTORS IN ASIA

The focus here is on Asia and the major CDs in this region. Since 2015, ICIS (2021a) have been publishing the Top 100 CDs list annually for North America, Europe, Asia, Latin America and Middle East & Africa. ICIS is an independent commodity intelligence services company providing market and commercial information to the global chemical commodities markets. They provide benchmark pricing information and insight on chemical and energy market across key chemical commodities market worldwide.

From literature review, ICIS has the most detail listing of CDs' sales annually and the Asia's listing are being used for further analysis here. It is apparent to anyone scanning the list of CDs that not all the CDs operating in Asia are included in the ICIS's list and, so the lists are not exhaustive by any measure. A number of the bigger CDs are not on the lists, particularly those from China, India and South East Asian countries. Asia's CDs like Samchem Malaysia (Samchem, 2021), Reda Chemicals Asia (Reda Chemicals, 2021), IXOM Australia (Ixom, 2021), Chemstation Asia (Chemstation Asia, 2021) and Luatan Luas Indonesia (Lautan Luas, 2021), just to name a few here, are all evidently not in the ICIS Asia's top CDs listing over the years. It is also worth noting that for many of the CDs listed in Asia, it is not easy to simply classify them as either commodity or specialty CDs because for many of the CDs, they are selling both commodity and specialty type chemicals. This applies to many of the global CDs as well as many of them have commodity and specialty chemicals in their portfolio. The Author do not attempt to separate the CDs by whether they are commodity or specialty CDs in this research, and this is probably best be left to be addressed through another research paper.

To give the readers a bit of perspective here, the total sales of all the CDs listed in ICIS top CDs for North America, Asia, Latin America, Europe, Middle East and Africa for 2019 and 2020 are valued at €79.2 bn (ICIS, 2020) and €86.3 bn (ICIS, 2021b), respectively. The forecasted chemical distribution market size for 2019 and 2020 (Table 4) are €262 bn and €276 bn, respectively, and the total CDs sales in the ICIS listings roughly worked out to be about 30% of the market size for both the years. For North America, the one-hundred-thirty-four CDs in ICIS lists recorded sales of €23.9 bn in 2019 (ICIS, 2020), and One-hundred-forty-one CDs in 2020 (ICIS, 2021b) recorded sales of €24.4 bn. This is against the backdrop of the forecasted North American chemical distribution market size of €42 bn and €43.5 bn for 2019 and 2020, respectively (Table 4). If the forecasted chemical distribution market size is true, or close to true, then the total sales by North America's CDs list accounted for over 56% of the total market size in 2020. One-hundred-forty-six CDs from Europe recorded sales of €22.4 bn in 2019 (ICIS, 2020) and one-hundred-seventy-five CDs recorded sales of €34.9 bn in 2020 (ICIS, 2021b) against the forecasted market size of €50 bn and €53 bn for 2019 and 2020, respectively. This would mean that the one-hundred-seventy-five CDs total sales in 2020 accounted for 66% of the forecasted market size.

As mentioned before, the sales recorded by the CDs in the ICIS list only form a portion of the total chemical distribution market. The total listed CDs make up of only about 30% of the total market size and make up of 56% and 66% of the total North American and Europe chemical distribution market, respectively for 2020. This lends credence to the forecasted market size, as rightly so, the forecasted market size is much bigger than the actual sales recorded. We only do not know how close the CDs total sales are relative to their respective market size, but over time with closer tracking of the CDs sales and the market size, this will become clearer.

In Asia, a total of seventy-six CDs recorded sales of €14.1 bn in 2019 (ICIS, 2020) and seventy-eight CDs recorded sales of €14.5 bn in 2020 (ICIS, 2021b). The forecasted market size for Asia is €160 bn and €168 bn (Table 4) for 2019 and 2020, respectively. This means that for 2020, the seventy-eight CDs sales only accounted for 8.6% of Asia's forecasted market size, which is very low as compared to North American and Europe. This is not surprising since a number of the larger Asia's CDs are not listed in the ICIS ranking table. This low percentage also further

reinforce the views that the Asia's chemical distribution business is very fragmented and there are many more CDs out there which are not in ICIS lists. Any investors looking for acquisitions in Asia would be heartened to know there are plenty of room for the Asian market to consolidate through M&A in the years ahead. Moving towards the future, it would not be surprising if there are more and more Chinese and Indian CDs coming within ICIS ranking radar. The number of CDs listed in the ICIS top CDs varies from year to year. To provide a common denominator for the data analysis, the Author decided to consider the sales by just the Top Fifty CDs in the ICIS Asia's list. From the ICIS lists of Asia's CDs for the year 2019 (ICIS, 2020) and 2020 (ICIS, 2021b), the total sales for the top Fifty CDs are worth €13.9 bn and €14.4 bn, respectively. They accounted for > 98% of the total sales of all the CDs listed for their respective year. ICIS top 50 CDs sales only accounted for 8.3% of the whole of Asia's chemical distribution market for 2020 as against 8.6% if considering for all the CDs. The difference is very small and hardly significant at all. So, just including the top Fifty CDs in Asia would be sufficient, as the differences between the top fifty and the total list, are very small.

From the total Asia CDs' sales of €8.4 bn for 2015, this would translate to a CAGR of 11% for the period 2015 to 2020 on the sales. The high CAGR may not be totally due to increase of sales and could be due to more CDs willing to report their sales to ICIS as the year progresses. The Author believes that going forward more and more Asia's CDs would be willing to reveal their sales revenues and will contribute towards a clearer Asia's chemical distribution sales and market perspectives.

A recap on the three main categories of CDs in this research, the Global CDs are those who operates in three major markets of North America, Europe and Asia as defined by the Author. The Regional-Foreign owned CDs are those who has company's ownership outside of Asia but with majority part of their sales derived from the Asian market. The Regional-Local owned CDs are those owned by Asian and operates predominantly in the Asian market. Figure 2 shows the sales by these three categories of CDs for the year 2018, 2019 and 2020. The Local-Local CDs are not shown here as there are too many of them and many of them have quite small sales revenues.

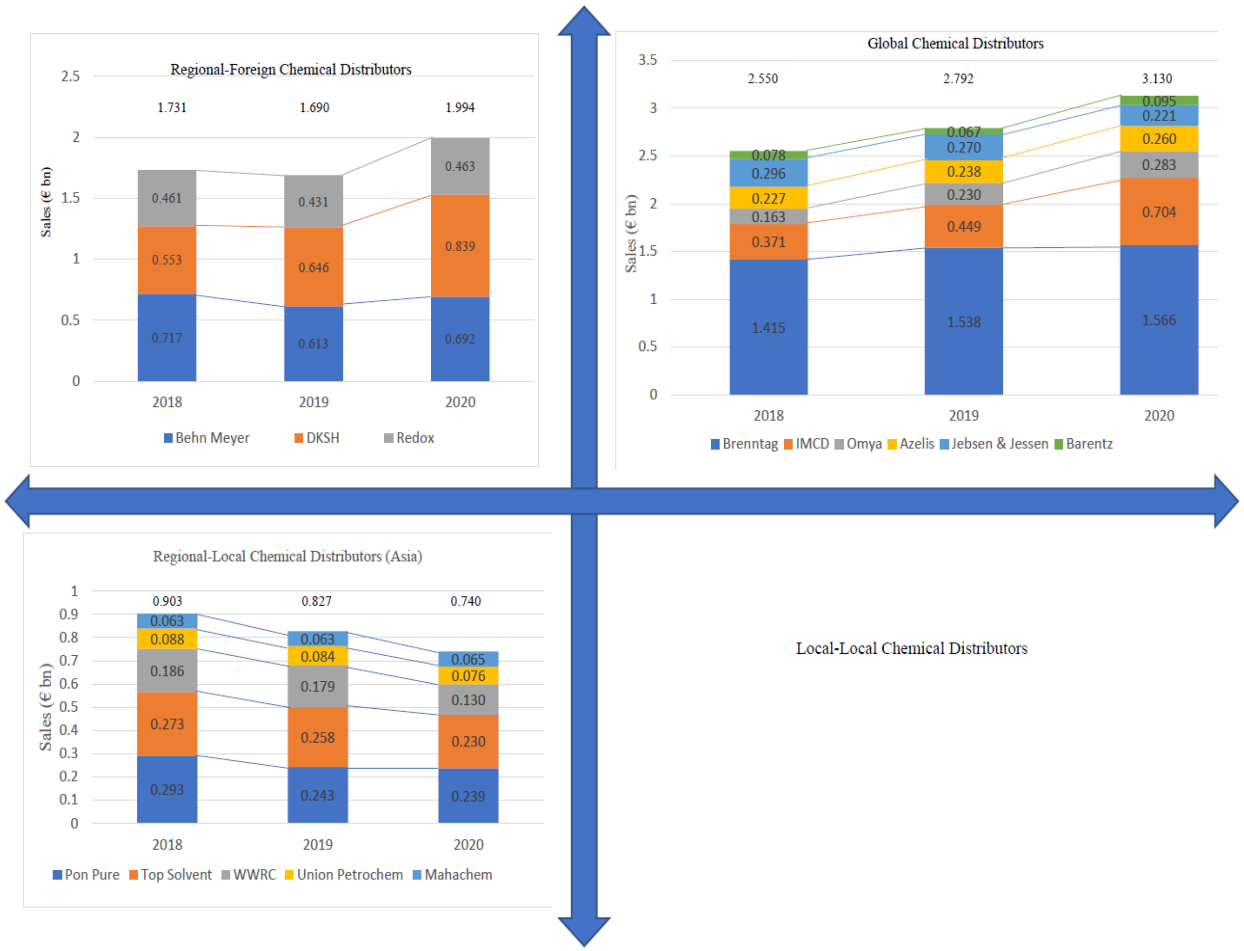


Figure 2: Asia's Major Chemical Distributors
Source: ICIS Top 100 Chemical Distributors (ICIS, 2019; ICIS, 2020; & ICIS, 2021b)
Notes:
€1 = US$ 1.12 was used consistently throughout.
Echemi (2021), though claimed to have reported sales of > €75m in the ICIS Top Chemical Distributors' listing for 2020, was omitted here as they do not appear to be a typical chemical distributor. They are probably more of an information provider. In their website (echemi.com) they claimed to be "*…. dedicated to building a chemical product database with weekly updated price*" and "*…. aim at helping our platform buyers analyze the market and purchase high-quality chemicals*," and "*…. assisting platform suppliers to promote their superior products.*".

Though Caldic (2021) would qualify as a Global CD, but as their sales in Asia is < €100 million, so they were not included. Univar (2021) too is a Global CD but was not included here because there is no information on their Asia's sales. The Global CDs sales were growing at a rate of 11.0% from 2018 to 2020. Much of this growth were due to their M&A activities, and growth through acquisitions will continue to be the key strategy in their quest for expansion in Asia. The Author also believes that other Global CDs, who have low exposure or no exposure at all in Asia, will be looking to invest into Asia in the coming years ahead and consolidation of the chemical distribution market will be happening at a faster pace.

DKSH (2021), Behn Meyer (2021) and Redox (2021) makes up of the three Regional-Foreign CDs. The three Regional-Foreign CDs were overall growing at about 7.3%, but the real growth contributor is actually DKSH, who was growing at 23%. DKSH sales revenue grew 30% alone in 2020 and this is mostly contributed by the acquisition of Axieo, that DKSH made in Australia, in late 2019. It potentially contributed over €100 million in sales in 2020 to DKSH. Redox has a steady presence in Asia and showed more or less stable sales over these three years. The notable absentee from the Regional-Foreign CDs' list is Connell (2021), which has a very broad and significant presence in Asia. Since a few years ago, they have stopped revealing their sales figures and so they were not included in this listing.

In the Regional-Local CDs group there were five CDs, namely Pon Pure Chemicals (2021), Top Solvent (2021), Maha Chemicals (2021), WWRC (2021) and Union Petrochemical (2021). As a group, their total sales were declining from 2018 onwards to 2020. Pon Pure, Top Solvent and Union Petrochemicals are operating mainly in the commodity chemicals sector, whereas WWRC and Maha Chemicals are in the specialty chemicals sector. However, in the case of many of the CDs it is not so easy to make a distinction in their sales activities as their products covers both commodity and specialty chemicals.

The Author would like to draw the attention to a few CDs, namely Sinochem Plastics, Tricon Energy, Opec Plastics and Mitsubishi Shoji Chemicals, which are listed in the ICIS Top CDs for Asia but yet are not being mentioned so far in this research. Sinochem Plastics (2021) is a wholly owned subsidiary of Sinochem Corporation, which is a Chinese state-owned company. Sinochem Plastics is the marketer of bulk petrochemical raw materials in the Chinese market, as well as in plastics raw materials and petrochemical derivatives for their parent company. In 2020, they recorded sales of €2.03 bn for Asia (ICIS, 2021). As they are a state-owned company and not a typical CD they were not included in this research.

Tricon Energy (2021), is a US based €6.60 bn sales company in 2019, recorded sales of €1.745 bn in Asia (ICIS, 2021). They trade mainly in petroleum and petrochemical derivatives including liquid gasoline, diesel fuels as well as biofuels. Mitsubishi Shoji Chemicals (2021), a Japanese based company, handles mainly functional chemical products for their parent company, which is the Mitsubishi Corporation Group, recorded €1.05 bn sales in 2020. Opec Plastics (Stavian, 2021), a Vietnamese based company, and had changed their name to Stavian in July 2021 recently. Opec Plastics recorded sales of €0.754 bn in 2020 (ICIS, 2021) and they are a producer of plastics resins as well plastic packaging materials. Kolmar (2021) recorded sales of €0.60 bn in 2020 for Asia (ICIS, 2021) is a biofuel producer in the US under the name of American Greenfuels. They service the petrochemical and oil product industry. All these four companies are not the typical CDs which are of interest here and so they were not included in this research. The six Global CDs, three Regional-Foreign CDs, and five Regional-Local CDs, a total of fourteen CDs, already made up 40.0% (€5.864 bn) of the total sales of the top Fifty Asian CDs for 2020 (ICIS, 2021b). This was out of a total of seventy-eight CDs listed for Asia, which goes to show that other than a handful of CDs which have large sales, many of the CDs have relatively quite small sales. The estimated chemical distribution market size for Asia for 2020 is worth €168 bn and the top Fifty CDs in Asia contributed a total sales of only €14.4 bn, which works out to be only 8.6% of the Asia's market size. After stripping off the sales recorded for Sinochem Plastics, Tricon Energy, Mitsubishi Shoji Chemicals, Opec Plastics and Kolmar, the total sales for

the balance of seventy-three CDs for 2020 amounted to €8.321 bn only. This means the sales by the fourteen CDs in Figure 2 amounted to 70% of the total sales recorded for 2020 by ICIS. This clearly demonstrate that there are a vast number of CDs in Asia which has smaller value sales plus and there are also many more CDs which are not yet being accounted for. The chemical distribution market is evidently very fragmented and offers a huge opportunity for more M&A to happen. The Author has no doubt that in the next ten years many M&A will take place and it should not surprise anyone that this initiative will be undertaken by the Global and Regional-Foreign owned CDs. China and India will be the main contributors to the M&A activities for the foreseeable future with a sprinkling of M&A deals within the South East Asia region.

CONCLUSIONS

The global chemical sales were identified and quantified with data from Cefic for the regions of North America, Latin America, Europe, Asia, Middle East and Africa. After establishing this, the Author has gone on to quantify the chemical distribution market size for all these regions. Two forecasted chemical distribution market sizes were arrived at by using the 2015 data as the base line; 1) pro-rating it to the global chemical sales; and 2) using a CAGR of 5%, using the 2015 assumed chemical distribution market size as the starting point. The final chemical distribution market size was ascertained by averaging out these two market sizes.

In summary, the Asian chemical distribution market size is estimated to be €168 bn for 2020, and it is still growing at a healthy rate. This can be further sub-divided into a chemical distribution market size of €106 bn for commodity chemicals and €62 bn for specialty chemicals. The chemical distribution market size can also be roughly estimated using the chemical sales and the GDP of the country. For Asia, the total chemical distribution market size can be roughly approximated to 7.2% of the chemical sales, and 0.61% of GDP for 2019. The GDP for the various countries in Asia varies very widely and users had to be discerning when using this finding. A longitudinal study on this finding had to be conducted to show its reliability and validity, and this could be the subject matter for another research.

With these data, strategic buyers or private equity firm investors, they would be able to identify the country of their interest, by first knowing the market size for chemical distribution. By carefully mapping out the key chemical distributors in the country of interest, the investors would be much better informed as how to approach the market without too much trial and error in the process. This can lead to waste of time, money, and to a lot of frustrations. This research is not able to provide all the answers to potential investors in preparation for their market study, and it was never intended to be so, as a very thorough longitudinal study would be needed to be conducted on all the individual major countries in Asia. This will lead to a multi-year studies which is out of the scope of this research. This research, however, hope to be a start for future research, leveraging on the findings here, and expanding and refining the data, as more information becomes available.

The seventy-eight CDs listed in the Asia's ICIS Top CDs 2020 listing recorded total sales of €14.5 bn, which represents only 8.6% of Asia's total chemical distribution market size. The fourteen Asian CDs mentioned in Figure 2, with total sales of €5.864 for 2020, represents only 3.5% of the total chemical distribution market. This clearly demonstrates there is a huge unmapped

sector of CDs in Asia, providing services to the chemical end users, which are not in the radar scan yet. This also revealed that the Asia's chemical distribution business is very fragmented and there are many more medium-to-smaller-sized CDs which has not been identified yet. This offers tremendous amount of opportunity for strategic buyers and private equity firms to further consolidate the chemical distribution business in Asia.

The findings also highlighted that both Indian and Chinese CDs are not yet well represented in the ICIS top CDs listing, and many of the CDs in South East Asia region are also not being included in the ICIS listing. The Author expects there will be more M&A activities in the South East Asia countries, as well in China and India, at least for the next ten years ahead. The M&As will be carried out by the private equity firms, global CDs as well as by the Regional-Foreign CDs and the acquired companies will mostly be from the Regional-Local, as well as the Local-Local CDs categories. The Author believed that at least one of the Regional-Foreign CD could be a potential target to be acquired by one of the global CDs in the next few years.

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