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AMBIT
ASSET MANAGEMENT

DISRUPTION SERIES

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CHEMICALS: CATALYSTS OR KRYPTONITE

DISRUPTION IS INEVITABLE: WE ARE PREPARED

We at Ambit are constantly trying to stay ahead of the curve by drowning out the noise and looking ahead. In keeping with our long term investment thesis, we like to stay up to date with not just the present impediments faced by your portfolio companies but also long term disruptions which can hit these companies. Hence we will regularly come out with our thoughts on disruptions in your portfolio companies/ sectors and for this write up of this series we have chosen the Chemicals segment.

A disruptive technology/ innovation is one that helps create a new market and value network, and eventually goes on to disrupt an existing market and value network (over a few years or decades), displacing conventional wisdom or technology. This note takes a closer look at Chemicals with a focus on **(1) The story of a new era of structural chemical growth and (2) The potential disruptors that you need to look out for along the way.**

WELCOME TO THE WORLD OF CHEMICALS

Chemicals ensure that we have heat and power; that we can buy goods and clothing; and that we have continual access to telecommunication, media and music wherever we are. They touch our lives every single day either directly or indirectly. There are 3 major classifications of chemicals (**Ref to Exhibit 2**) and multiple uses we ought to know about while studying chemistry from an investor's perspective.

(Ref to Exhibit 1)

The Global Chemicals market has transformed in the last decade or more driven by larger spending by developing economies to gain prominence in Chemicals. China has seen the maximum gains in market share driven by maximum capex and government backing while EU has seen significant market share losses spurred by higher costs making new investments economically unviable across a variety of categories. Against this back drop of a global chemicals market growing towards becoming a trillion dollar market, India is a small blip with a long runway for growth with possibility of higher growth vs. peers. **(Ref to Exhibit 3-6)**

With the increasing trend of global chemical giants towards specialization and focus, A huge opportunity has opened up for developing countries like India to capitalize on the plethora of opportunities coming its way given the high degree of outsourcing by larger companies. **(Ref to Exhibit 7-9)**

While India and China would both benefit amongst other countries China has seen some pushback from the Global community in recent times given a number of varying factors. **(Ref to Disruption point 2)** China will still remain an important supplier to the world and an innovator as well in the future but India can gain if it plays its card right.

Exhibit 1: Chemicals have multiple uses but the major ones from an investors perspective include

Top Segments in Specialty chemicals exports	Global Market CAGR 2018-23 %	Global specialty chem exports USD BN	China (% of Global specialty chem exports)	India (% of Global speciality chem exports)	Key insights
Intermediates for APIs	6-7%	77	11%	4%	1) China's export value in top 3 segments is 2.7x that of India's. 2) India can aim for deeper market penetration on these segments.
Agrochemicals	2-3%	72	17%	6%	
Dyes & Pigments	2-3%	66	12%	5%	
Plastic additives	3-4%	15	8%	1%	1) China's export value in the next 6 segments is 12x that of India's. 2) These segments provide new opportunities for India to explore.
Electronic Chemicals	4-5%	15	22%	0%	
Food/ Feed additives	2-3%	12	19%	2%	
Nutraceuticals	4-5%	10	46%	2%	
Rubber chemicals	2-3%	5	27%	2%	
Flavours & fragrances	3-4%	5	46%	12%	

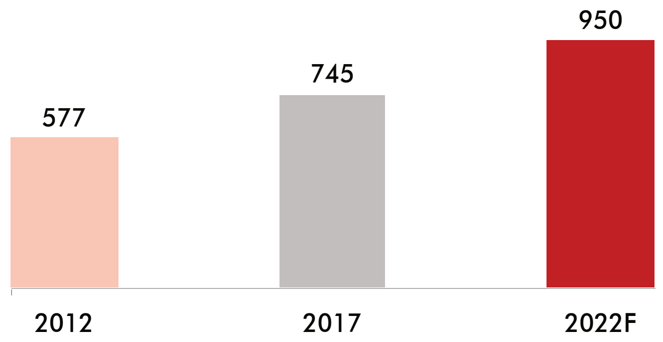
Source: Ambit Asset Management, Company

Exhibit 2: Chemicals classification

Drivers	Companies benefiting from the same
Petrochemicals	The Middle East likely to gain share given considerable investments towards forward integration from oil majors
Speciality Chemicals	Europe is incrementally outsourcing to India. China will also emerge as an innovator itself but would lose it's share as a major supplier
Base Chemicals	China would remain competitive due to better RM availability, scale & efficiency of the industry, some areas where Indian players are already there may benefit as Chinese industry cost structures themselves have gone up

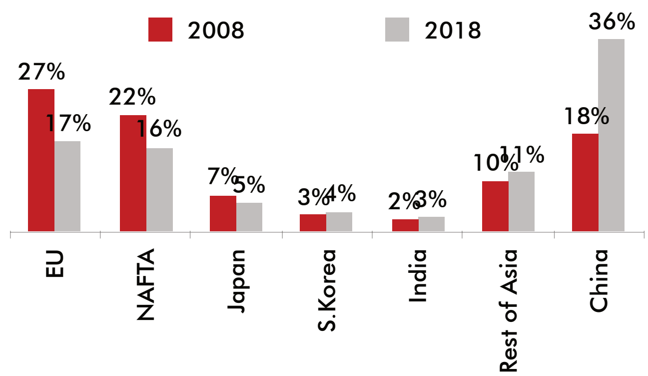
Source: Ambit Asset Management, Company

Exhibit 3: Global specialty chemicals market size as of 2017 ($bn)



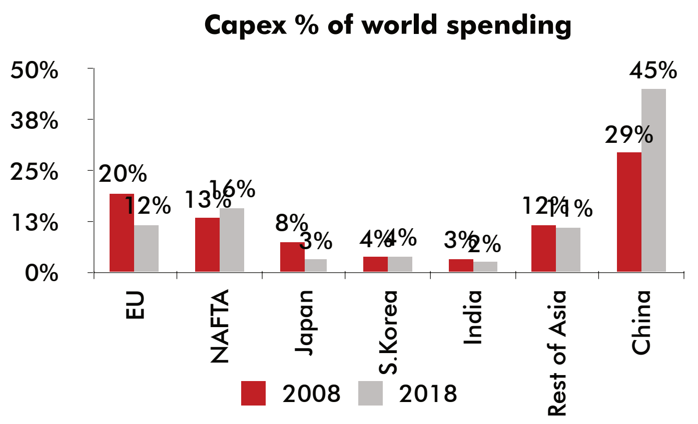
Source: Ambit Asset Management, Aarti Industries

Exhibit 4: The World market share has evolved significantly with China gaining most and EU losing most



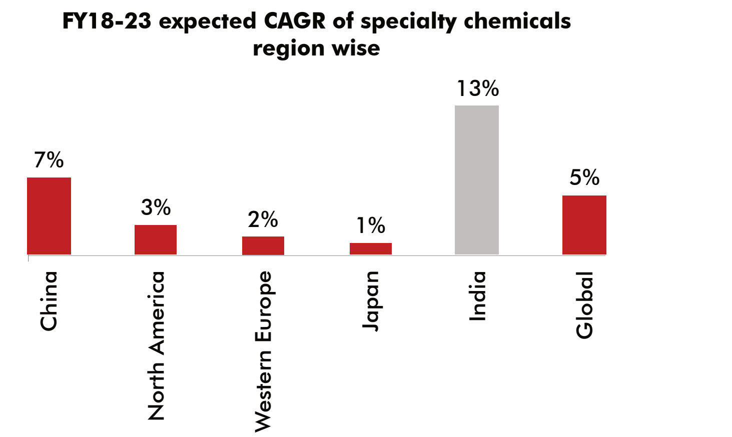
Source: Ambit Asset Management, Company, Cefic

Exhibit 5: This has been driven by capex spending's led by a big margin by China over the past decade



Source: Ambit Asset Management, Company, Cefic

Exhibit 6: India still is much smaller in size and scale but with a low base comes higher growth opportunity



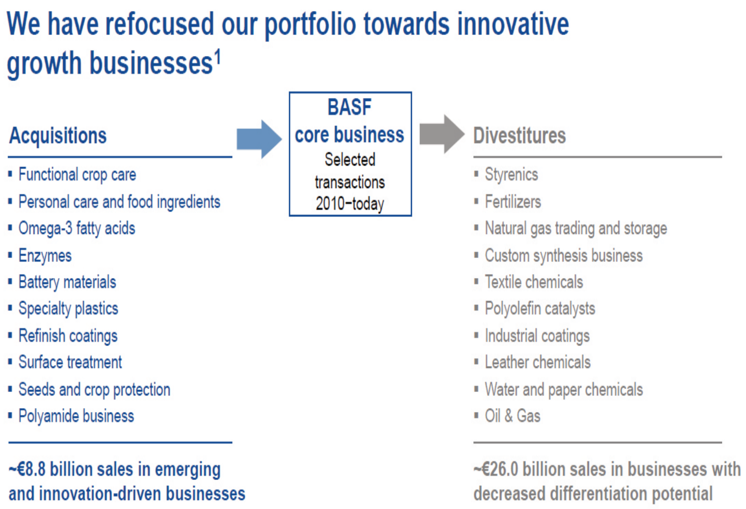
Source: Ambit Asset Management, Aarti Industries

Exhibit 7: Separately an increasing trend of M&A towards focus areas by larger players...

Particulars	Year	Segment restructured
Clariant	2020	Masterbatch business Merger of Dow and Dupont and split into three companies
Lonza Group	2019	Separate entity for Agrochemicals, Specialty Products and Materials Science
Evonik	2019	Methacrylates business
BASF	2019	Pigment business
Hunstman	2019	Surfactant business
Akzo Nobel	2018	Speciality chemicals business
Solvay	2015	Cytec

Source: Ambit Asset Management, Company

Exhibit 8: ...including specialization towards certain types of chemistry have added to the opportunity pool



Source: Ambit Asset Management, BASF Annual report

Exhibit 9A: Indian companies are likely to absorb all these benefits and create a right to win opportunity in certain niches

Drivers	Companies benefiting from the same
European MNCs exiting certain chemical segments due to cost pressure	Exiting pigments, wood chemicals, and rubber chemicals due to cost pressures. Companies like Sudarshan would benefit.
European MNCs exiting certain chemical segments due to EHS pressure	Dyes, certain old agrochemicals like Mancozeb/Triazoles. Companies like Bodal, UPL, Astec benefited.
Growing outsourcing by global players	With increased hassles on cost and ability to invest in heavy capex, many chemical companies manufacturing outsourcing is picking up. Companies like PI, SRF, and Aarti are benefiting.
Indian player gaining share in chemicals sourcing from China	With growing issues in China, many companies have started to outsource more to India while reducing their sourcing from China.
Indian companies into specialized chemistries (The knowledge advantage)	Companies like SRF and Navin Fluorine are benefiting from their strong capabilities on fluorination.
Indian companies growing due to import substitution	Indian buyers also prefer Indian suppliers. Likes of Vinati Organics are incrementally targeting these opportunities.
Indian companies taking Chinese head-on	Companies like SRF are taking Chinese manufacturers head on, on products like refrigerants despite RM advantage enjoyed by Chinese players. Companies like UPL too have better competitiveness on products like organophosphates due to their historical strengths on product.

Source: Ambit Asset Management, Company

Exhibit 9B: Some of the leading Indian companies today and the right to win opportunity they are focussing on

Companies	Focus areas / Right-To-Win
PI Industries	Track record, Relationships, Custom synthesis
Aarti	Benzene & Toluene
Sudarshan	Specialty pigments
Vinati	Leadership in ATBS & IBB, Green chemistry
Navin Fluorine	Fluorination
SRF	Fluorination, Technical textile
Galaxy Surfactants	Relationships with FMCG majors
Ultramarine	Global leader in Ultramarine Blue
Neogen	Bromine & Lithium
Alkyl Amines	Leadership in amines, Specialty chemicals like Acetonitrile
Tata Chemicals	Significant and steady cash generation in Soda Ash business
UPL	Wide range of chemistry capabilities, Dominant player globally

Source: Ambit Asset Management, Company

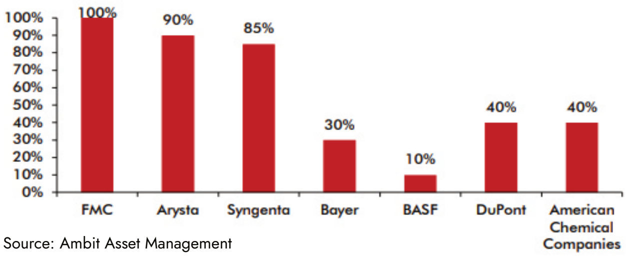
DISRUPTION IN CHEMICALS: CONSTANT CHANGE

1. **3C's – Consolidation / Core focus / Complexity:** From the above backdrop of the evolving Industry structure 3 key themes are likely to play out and have already begun to progress. These include Consolidation through Mergers and acquisitions and a Core focus towards remaining in businesses with a right to win element while exiting others **(Ref to Exhibit 7-9)**. This leaves a higher chance for Indian companies to benefit through larger exports due to increased skills and higher outsourcing requirements of global chemical giants **(Ref to Exhibit 10 & 11).** It also continues to borrow on the K shaped recovery theme that we have spoken about frequently in our previous written correspondence. The strong will get stronger! Those companies moving against this tide will likely be heavily disrupted.

2. **The 4th C is China+ 1: One man's poison is another man's food**
   i. China has been one of the largest disruptors across the globe. Companies shiver at the mere mention of this five letter word. China has become a large player in chemicals and from being a supplier to the world; China is now evolving to take on the additional responsibility as an innovator as well. Research and innovation spending share will be a larger portion of spending in times to come. **(Ref to Exhibit 12)**.China's large spending budgets and focus on creating a chemical hub have disrupted chemical companies all over the world including India over the past decade.
   ii. However more recently self-disruptions in China have made India a relatively more attractive destination for investment and business in comparison.Instances of Chinese self-disruption over recent times are listed below **(Ref to Exhibit 14)** and these along with (1) rising labour costs, (2) lower availability of bank financing, (3) lower Government subsidy and a (4) higher focus on environment have led to what is now popularly called as the "China+1 strategy" or the diversification of supply chains away from China to reduce dependence on one country alone.
   iii. Last but not the least China is still a significant player and will continue to be so. Despite the relative attractiveness of China reducing and costs rising, the overall costs in China are still lower than they are in India. In absolute terms, China is better in certain respects and so competing Indian companies need to be very careful but in relative terms the importance of opportunities for Indian companies stands out in certain areas.

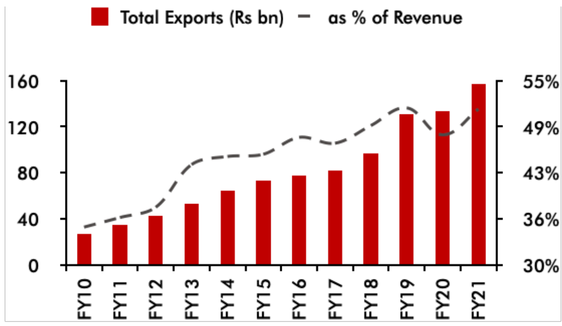
Our interaction with industry experts suggests, China's economic strategy is shifting from outward-looking to more inward-facing with focus on Centralization. This is in contrast to last 10 years when private enterprises were allowed to operate freely and for profit. Recent crackdowns indicate that pollution control is a top priority for the government and Basic Chemical industry is being seen as highly polluting with little contribution to GDP.

Exhibit 10: Outsourcing as percent of revenue of largest chemical companies in the world gives opportunity...



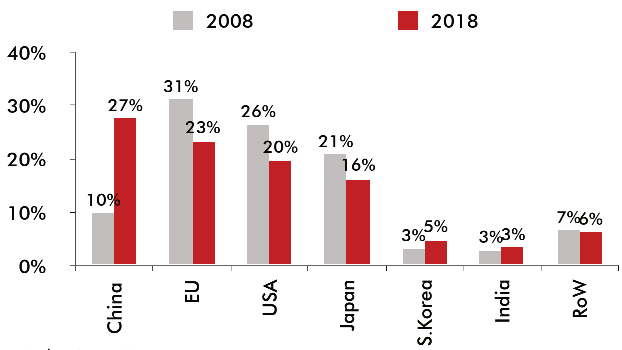
Source: Ambit Asset Management

Exhibit 11: For Indian companies to enhance higher value exports (FY10 35% has moved to FY19:51%)



Source: Ambit Capital Research, Ambit Asset Management, Note:1) We have taken PI Industries, SRF, Aarti Industries, Atul, Vinati, Sudarshan, Navin Fluorine, Deepak Nitrite, Neogen and NOCIL for the calculation. 2) During FY11-13, NFIL and SRF received carbon credits which boosted margins.

Exhibit 12: Research and innovation spending share by EU, Japan, US decreased



Source: Ambit Asset Management

Exhibit 13: Indian companies are finding their niches and focusing on greater specialization

Companies	Focus areas / Right-To-Win
PI Industries	Track record, Relationships, Custom synthesis
Aarti	Benzene & Toluene
Sudarshan	Specialty pigments
Vinati	Leadership in ATBS & IBB, Green chemistry
Navin Fluorine	Fluorination
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Galaxy Surfactants	Relationships with FMCG majors
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Neogen	Bromine & Lithium
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Tata Chemicals	Significant and steady cash generation in Soda Ash business
UPL	Wide range of chemistry capabilities, Dominant player globally

Source: Ambit Asset Management

3. Those without focus on Relationships + Integrity + Long term will lose: Chemical companies need to work hard on building relationships with their customers. It takes many years to get a large supplier status (or even a regular supplier status) followed by many years for building credibility. Moreover businesses which involve technology sharing require a great deal of trust which comes only with time and through reputation. A lot of Indian companies do better than Chinese companies here as they have built a reputation on trust and not divulged secret formulas or technologies of global customers to market participants or come out with their own me too products priced at a much lower rate.

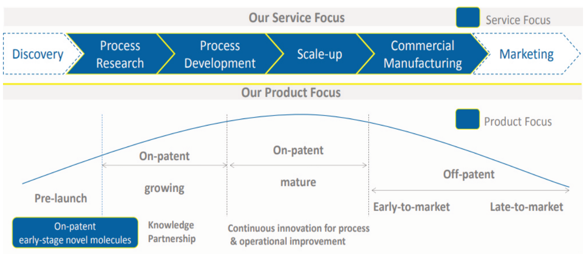
CASE IN POINT: Evolution of PI Industries by building trust over long periods of time and working with customers through product lifecycles

PI industries is one such company that has transformed over the years into a meaningful chemical player by leveraging its relationship with its large, well established and important chemical customers.

Exhibit 16 makes it quite clear on how long term relationships and customer consciousness play an important role in getting business. However, once that relationship is established, it is equally hard to dislodge the same.

PI focused on long term relationship and customized product/service offering as well as worked with customers through their entire product life cycle (hence growing with customers) to taste success (**Ref to Exhibit 17**). After many years of building

Exhibit 17: PI partners with companies from initial stages and works with companies through the entire product life cycle...This builds trust and many chances to show credibility



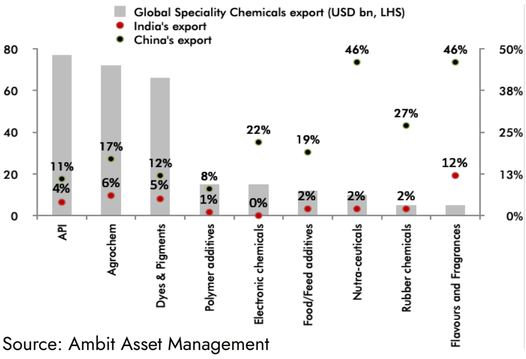
Source: Ambit Asset Management, PI Industries company presentation

Exhibit 14: While there have been earlier instances of disruption too, these are the more recent disruptions that have taken China by storm and made India look attractive by comparison in recent years

Events	Timeline	Remarks
13th five year plan	July, 2017	The 13th five-year plan covering the period of 2016-20 resulted in heightened focus of Chinese government on environment. The plan also highlighted shifting of chemical production to chemical parks and also reducing the number of parks.
Winter shutdown	2017, 2018	China had closed many of its manufacturing units for two months to cut emissions in order to prevent smog and promote blue sky
Trade war	2018-2019	The series of tariffs imposed by US on China led many MNCs to look for alternative to China in order to diversify their supply chains away from China
Jiangshu Blast	Mar-19	A major explosion at a chemical plant in Chenjiangang Chemical Industry Park resulted in death of more than 78 people. Chinese government closed the entire region which led to sharp increase in product prices
Coronavirus	2020	After two consecutive years of winter shutdown, Chinese government didn't go ahead with winter shutdown in 2019. But coronavirus led to prolonged shutdown after Chinese New Year, disrupting supply chains and logistics

Source: Ambit Asset Management

Exhibit 15: India now looks attractive by comparison in recent years and going ahead too this will have an impact on growth of Indian chemicals industry for companies that focus on categories where they have a "Right to Win"



Source: Ambit Asset Management

Exhibit 16: PI's Salil Singhal on how the foray into CSM business commenced through long gestation relationship building

"Company was in-licensing certain molecules from a Japanese player. On one of the business trips, I realized many countries had high costs including Japan.
We met an executive from a large trading company Mitsubishi.

He told me that if you are patient enough, maybe over 5-7 years you would see a big success. Our first order was 890k dollars.

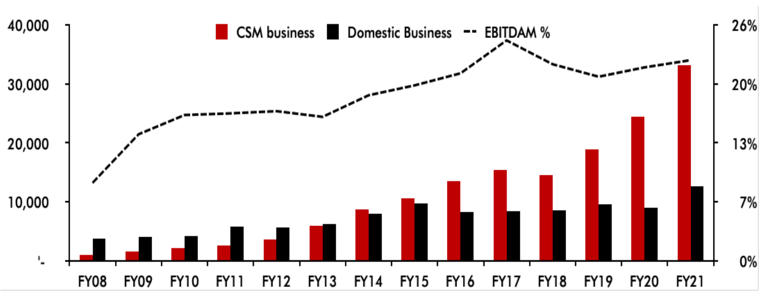
It required an investment of 250mn. They said if you successfully supply this, we will give you far bigger orders however there is no guarantee if you don't deliver well.

This was the turning point of our company and the onset of the CSM business. We took the risk, and rest is history."

- Mr Salil Singhal in an interview with VC Circle

Source: Ambit Asset Management

Exhibit 18: As PI deepened its relationships its CSM business grew multifold as can be seen over more than a decade, which ofcourse also led to better margin profile for the company...Today PI enjoys relationships with >15 global innovator companies which form a strong competitive moat for it



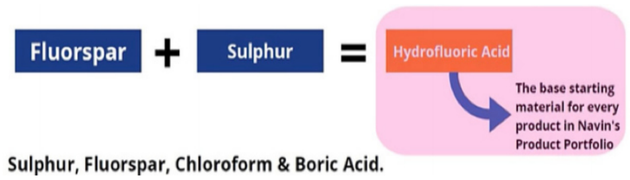
Source: Ambit Asset Management, Company

4. **Avoid weak process companies as they are prone to disruption:** Chemical companies (especially Indian chemical companies) need to operate in an area where they have a strong Right to win and unique selling proposition which is not just limited to cost (as Chinese companies are much better at competing on costs). A differentiated proposition or superior advantage is what helps overcome disruptions to Chemical businesses, some examples include:
   i. Alkyl Amines' production of Acetonitrile **using the superior route** using Acetic Acid and Ammonia (which leads to superior output) vs through Acrylonitrile route, which is adopted by many competitors globally.
   ii. Navin Fluorine is increasingly becoming known as the Fluorine specialist. It is an identified niche the company thinks it has a 'Right to Win' in and so has focused all its efforts and energies around this single and unique chemistry. (**Ref Exhibit 19**)
   iii. Aarti Industries which is **backward integrated** in a lot of its products, take for instance its Benzene value chain, which allows cost control and uninterrupted supply and reliability of delivery schedules (**Ref Exhibit 20**)
   iv. A **geographic competitive advantage** for a company like Neogen which accesses Bromine available in sufficient quantity in the nearby Rann of Kutch allowing it to lower its manufacturing cost vs peers.

5. **The ESG age of doing business is here! Flouters to be left behind**

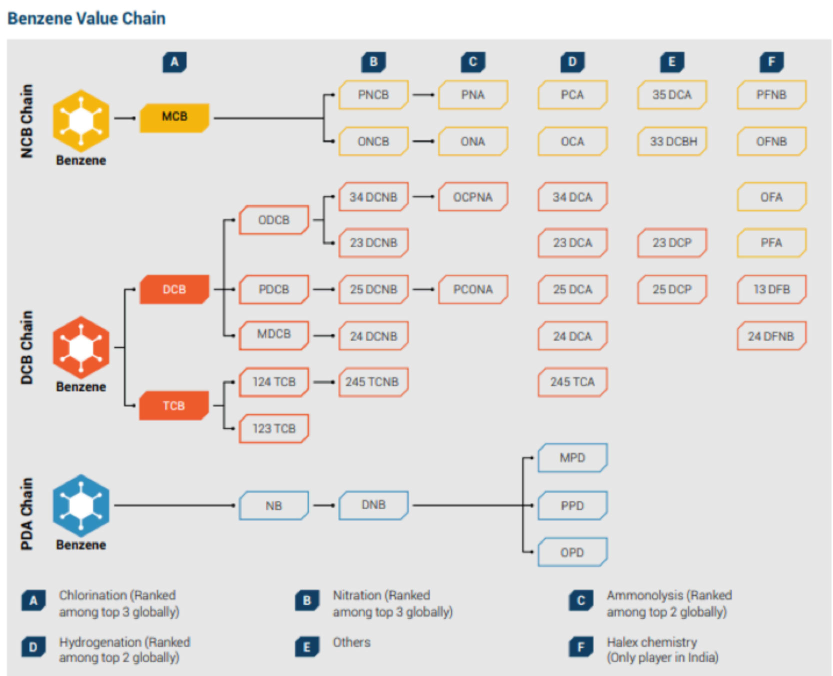
   i. **Importance of ESG and an example of Alkyl:** Chemical companies that have tasted success and wish to continue doing so need to keep up to date with the latest practices of doing business or can face high level of disruption. We look at ESG through (1) QSHE (2) Capable Talent (3)Credible board and take up an example of Alkyl Amines **(Ref Exhibit 21)**

Exhibit 19: Navin is a Fluorine specialist with a focus around only Fluorine chemistry



Source: Ambit Asset Management

Exhibit 20: Aarti is backward integrated in multiple value chains, this picture showcases its Benzene value chain (Follow through A to F to see their unique advantage in each)



Source: Ambit Asset Management, Aarti Industries FY21 Annual report

Exhibit 21: The new age of ESG can be looked at into 3 broad categories: (1) QSHE (2) Capable Talent (3) Credible board

QSHE (Quality - Safety-Health-Environment)	**Inducting relevant talent**	**Credible Board**
· Investments in building global standard QSHE. · Accreditation by Ecovadis or Responsible care. · Clean track record on safety; certificates from regular client audits.	· Hired experienced professionals from larger companies/MNCs. · Management team function of old loyalists and seasoned resources from other companies.	· Mix of credible people from finance, sales, R&D, ex-senior management of customers. · Moving beyond friends and family board.
Examples of Alkyl's focused on QSHE)	**Alkyl has retained talent and started planning and hiring 2nd layer of management**	**Alkyl has a strong board with relevant members to ensure independence an**
· Alkyl has Integrated Management System Certifications: · ISO 9001 - Quality Management System; · ISO 14001 - Environmental Management System; · ISO 18001 - Occupational Health & Safety Management System; · ISO 50001 - Energy Management. · Alkyl got recertified for Responsible Care® in Sep'17	· Successful in retaining talent; Mr. Kirat Patel (Executive Director) has been the 1st employee of the company. · Data as per LinkedIn indicates many employees from the R&D team have been with the company for more than a decade now	· Alkyl's board consists of nine members, out of which six are independent. · Board comprises reputed industrialists; Mr. Gupte and Ms. Hattiangadi are board members with background in chemicals

Source: Ambit Asset Management, Company, QSHE=Quality, Safety, Health & Environmental parameters

ii. The downsides of non-adherence: Globally one of the topics gaining the most traction and importance is that of preserving and protecting the Environment (The 'E' in ESG). This is best demonstrated in the crackdown by Chinese companies on environmental offenders and raising the environmental cost of compliance for the country's chemical manufacturers. (**Ref Exhibit 22**).

6. Regulations Alert! The disruptor of the decade

Regulations have the ability to disrupt markets. While sometimes regulatory disruptions can be positive sometimes it can be negative too for companies and their operations.

i. Products getting banned (eg. Red Triangle ban): Pollution concerns are a big issue surrounding chemical companies and are subject to control by many authorities including the Pollution control board in India. For instance the government had as recently as last year proposed a ban on 27 pesticide products The list contains 12 insecticides, eight fungicides and seven herbicides. Three of them have red triangle (highly toxic), eight have yellow triangle (Toxic), 12 have blue triangle (moderately toxic) and four have green triangle (slightly toxic).

ii. Incentive schemes & withdrawals: have the potential to protect and enhance growth of its beneficiaries. For instance MEIS schemes have been created for exports and exporters. The rates can vary from product to product or from country to country. These schemes when availed have significant financial benefit for the companies involved. The schemes have recently been withdrawn and caused disruption on this account.

iii. Delay in granting regulatory approvals to toxic or dangerous chemicals: In chemicals segment some chemicals can be toxic, dangerous to health of the manufacturing laborers, have detrimental impact on environment or even have use in warfare for instance. Some of these products are heavily regulated with limited approvals given out.

Let us take the example of Paushak chemicals who is the manufacturer of Phosgene gas. Given the toxic nature of Phosgene gas and danger of transport the gas has rarely received approval for capex and capacity expansion. It was only after many years of operating at a much lower capacity (vs demand) that Paushak eventually got its approval to set up capacity from 5,000KTPA to 15,000KTPA.

iv. Response to Toxic Accidents can be detrimental to companies continuing: In chemicals segment some chemicals can be toxic. Safety is of the highest priority. An example of toxic chemicals leading to a number of deaths reminds us of the Bhopal gas tragedy that took place on the premises of Union Carbide. The losses of human life were severe and the company came to a shut down by authorities all together almost overnight.

Exhibit 22: Major regulatory compliances to curb pollution by Chemical companies taken in China since CY12 has led to many closures/permanent shutdowns

Type	Issue/ Execute Date	Measures	Issued By*
Plan	CY11-15	12th Five-Year Plan	State Council
Law	Executed Jul'12	Clean Production Promotion Law	NPC
Plan	Issued Oct'12	The 12th FYP on Prevention and Control of Air Pollution in Key Regions	MEP, NDFC, MoF
Plan	Published Jun'13	National 10 measures	State Council
Plan	Issued Sep'13	Air pollution prevention and control law	State Council
Law	Amended Apr'14	Enviromental protection law	NPC
Law	Executed Jan'16	Air pollution prevention and control law	NPC
Plan	Issued Jul'14	Performance Assessment Measures for Air Pollution Prevention and Control Action Plan	State Council
Standard	Executed Jan'16	National Ambient Air Quality Standard	MEP
Plan	Executed Aug'17	Action Plan to Comprehensive Control Autumn and Winter Air Pollution in Beijing-Tianjin-Hebel and Surronding Regions 2017-2018	MEP
Standard	Varied	Emission standard of air pollutants for industries	MEP,AQSIQ
Plan	CY16-20	13th Five-Year Plan	State Council

Abbreviation: NPC - National People's Congress; MEP - Ministry of Environmental Protection of the People's Republic of China; MoF - Ministry of Finance; NDFC - National Development and Reform Commission; AQSIQ - General Administration of Quality Supervision, Inspection and Quarantine;

Source: International Journal of Environmental Research and Public Health

CASE IN POINT: No turning back from Bhopal gas tragedy for Union Carbide

On 2-3 December 1984, methyl isocyanate (MIC) leak from Union Carbide factory (UCIL) pesticide plant in Bhopal, Madhya Pradesh was considered as one of the worst industrial disaster in the world. The blast was caused due to poor safety and security and absence of risk management in the company's industrial sites.

The government of Madhya Pradesh confirmed a total of 16,000 deaths related to the gas release. It left an estimated 40,000 individuals permanently disabled Union Carbide was sued by the Government of India and agreed to an out-of-court settlement of US$470 million in 1989. The plant site has not yet been cleaned up. Warren Anderson, CEO at the time of the disaster, refused to answer to homicide charges and remained a fugitive from India's courts. The U.S. denied several extradition requests. Anderson died on 29 September 2014 in Florida.

v. Regulatory bodies in chemicals can disrupt operations, cancel licenses, act on pollution complaints amongst a long list of potentially disruptive actions can be taken against a chemical plant. Another segment which comes to mind when we think of regulatory compliance is the Pharma sector which will help me make the point more clearly of the potential disruptive force of regulatory action through a well-known example.

CASE IN POINT: Sun Pharma's Halol facility in Gujarat

This facility came to the company post its acquisition of MJ Pharma in 2005 and has been under constant regulatory troubles for the last seven years. The plant received Warning Letter in Dec-2015. It contributed ~15% SUNP's overall revenues. The subsequent remediation measures created supply issues which impacted Sun's US revenues in the ensuing quarters. It also resulted in delayed product launches which eventually had to be shifted to another facility. While the facility was cleared in 2018 (classified VAI), it was again classified OAI in March 2020. The current contribution is expected to be in the range of 3-4% of overall revenues. In addition to Halol, Karkhadi and Tonsa plants are also under remediation awaiting USFDA clearance.

7. Disruptions due to Supply Bottlenecks:

Supply bottlenecks cover anything that impedes or stops the production of a product or delivery of a service. Taking 2 examples of such disruptions we can see how these disruptions can be harmful in practice to companies.

Raw material: Example of Neogen's dependence on Lithium: (**Exhibit 25**) Lithium is an important raw material for Neogen and 20% of its Revenue is dependent on its availability. 45% of World's Lithium comes from Chile & Argentina who also happen to be cheaper manufacturers for the chemical. The raw material is not available in sufficient quantities in India and so 30-40% of the raw materials are imported from countries like Argentina, Chile, Bolivia, Israel, and Jordon. Since the quantities are coming from far off lands it is more economical to order large quantities and store them in India. This large inventory leads to higher working capital requirements for the company. Disruptions here can include lack of availability of raw material due to shortage or large inventories piling up if end customer orders are cancelled.

Unavailability of key components: Example of GLE shortage and GMM Pfaudler (**Exhibit 26**)GMM Pfaudler is one of two Indian player manufacturing Glass Line Equipment (GLE) in India which are largely used in Chemical and Pharmaceutical plants in India. As Chemical companies invest in new plant and machinery or set up new capacities to meet unmet demand, the unavailability of or waiting period caused by supply from GLE manufacturers can cause large delays and lost revenue and profits for companies.

8. Potential Demand destruction can be highly disruptive:

One of the important disruptions that can take place in Chemicals includes demand destruction which can be brought about by:

i. Over reliance on a specific set of customers or for instance Large order cancellations for long term contracts like in the case of one such contract which was cancelled for Aarti Industries in the past.
ii. Obsolescence of a particular process or chemical or emergence of a newer or cheaper technology replacing an older one can also have a similar effect of demand destruction. We can take another famous example of one of our portfolio Pharma companies to showcase the impact of disruptions can have.

Laurus Labs, for instance, faced a near-term disruption in 2018 when WHO changed the preferred 1st Line treatment of Anti-Retroviral therapy – used to treat HIV patients – from Efavirenz (EFV) based regimen to Dolutegravir (DTG) based regimen. In FY19, 60% of Laurus' ARV API revenue came from EFV. While Laurus was successfully able to transition to DTG based regime, there was an impact on its near-term financials. This was an example not only of a disruption but also of a company that was able to adapt and overcome a disruption.

Exhibit 23: Outsourcing as percent of revenue of largest chemical companies in the world gives opportunity...

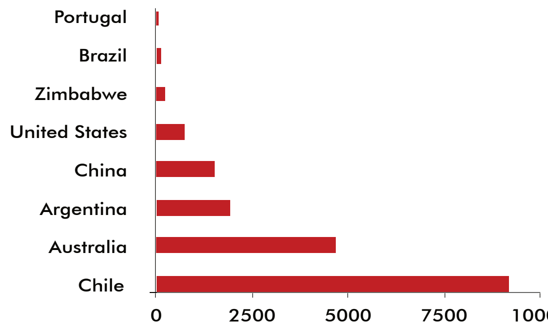
Source: Ambit Asset Management, BASF presentation

Exhibit 24: Sun Pharma US sales declined 34% from FY16-21, one reason being Halol – a major facility –faced constant issues since 2014

Date	Events/ Observations
Sep-14	FDA issued Form 483 with 23 observations, plant status changed to OAI
Dec-15	Warning letter issued with 6 observations
Dec-16	Plant re-inspected, issued 9 Form-483 observations
Feb-18	Plant re-inspected, issued 3 Form-483 observations
Jun-18	Plant status changed to Voluntary Action Indicated (VAI)
Jun-18	Establishment Inspection Report (EIR) received
Jun-18	FDA issued Form-483 with 8 observations, plant status changed to OAI in Mar-20

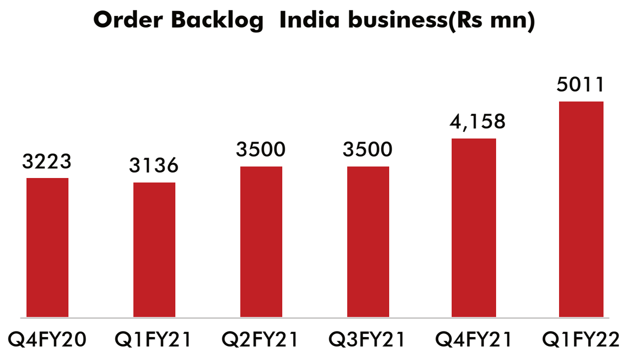
Source: Ambit Asset Management, Sun Pharma Company

Exhibit 25: Countries with largest Lithium reserves worldwide in 000's (2020)



Source: Ambit Asset Management, Statista

Exhibit 26: Order backlog for GMM is 500crs worth of orders while HLE glass coat (No 2 player) has 6-7month backlog



Source: Ambit Asset Management, GMM Pfaudler company presentation

iii. Disruption in end user Industry

The changing landscape of end user industry can be seen across a variety of segments in Chemicals. Some examples of this include:

1. Moving to better chemistry for instance a preference of Fluorine chemistry over Chlorine chemistry
2. Potential long term deterioration in end user industry: ATBS is a key product of Vinati Organics and 25% of its demand is derived from the Oil & Gas segment. If Electric vehicles or greater adoption of renewables were to become the norm this business would be impacted negatively.
3. Changing requirement for chemicals: Ethanol policy changes and uses might impact the demand and pricing for Ethanol in India and globally. This would impact chemical company such as Jubiliant Ingrevia that uses Ethanol as a raw material.

9. The Human element of disruption:

Promoter driven companies: Boon or bane?

In India a number of companies are promoter driven and this is especially true for chemical companies. While many of these promoters have been able to scale up successful businesses upto this point by calling the shots, running the day to day operations and many themselves being technocrats the next leg of growth would require professionalisation to ensure business continuity and scaling.

While the promoter involvement has been a boon so far it can very well become a bane at a point in time once a certain scale is achieved. Promoters that fail to recognise this fail to scale or fail all together eventually. The Indian custom of dividing companies between family members to run can also lead to break up of different businesses at times against interest of minority shareholders and only done in order to ensure each family member feels well represented.

Management Hubris: Leverage Trying to become too big too fast with a lot of front ended capex or acquisition sprees can multiply your returns but can also divide them if investment and business cycles are badly timed. (**Ref to Exhibit 27**)

Labour availability/ Talent shortage

The fight for top quality talent has been meaningful and we see hiring across the board on R&D, technology transfer, design and engineering, business development. Indian companies have hired top quality professionals from global chemical companies. (**Ref to Exhibit 28**)

10. The elusive Pharma segment: Will it be an opportunity or curse for chemical players?

i. Pharmaceutical opportunity to chemical players? The pharmaceutical segment is much larger in terms of the size of opportunity it provides vs the chemicals segment. It also provides the benefit of higher entry barriers and higher customer stickiness to established players.

It is no wonder many chemical companies have eyed the Pharma segment for long.(**Ref to Exhibit 27**).

ii. Chemical players moving into Pharma:

CASE IN POINT: PI Industries acquisition of Ind Swift Laboratories (ISLL) - While the move seems to be having the right long term motivations and is also immediately EPS accretive for PI, a transaction of any nature is tough (Don't believe me? Ask Tata motors about Jaguar Landover) it thus makes a tough task all the more, tougher when it is in a different segment and has a potential to disrupt.

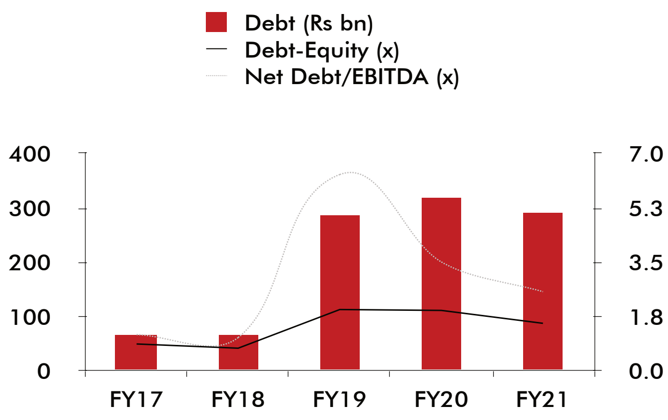
Overview:

a. The transaction: PI will acquire API business division of Ind Swift Laboratories for EV of Rs. 15bn. ISLL had FY21 Revenues/ EBITDA/EBITDA margin of Rs. 8.6bn/2.0bn/23.6%

b. Valuation: Transaction implies EV/EBITDA of 7.6x & adjusted P/E of 17.8x.

c. ISLL overview: Manufacturer & exporter (~75% mix in FY20) of active pharma ingredients (API) & intermediates. The company has a portfolio of 20+ products (leadership position in several). Manufacturing facilities are accredited from regulatory agencies including USFDA and others. Revenue mix from regulated/ soft regulated market in FY20 stood at 52%/48%

Exhibit 27: While UPL has grown from strength to strength over decades, the alarming amount of debt has made investors uncomfortable given leverage increases business risk



Source: Ambit Asset Management

Exhibit 28: Examples of the recent spur of hires in Aarti Industries

Recent hires	Designation	Past Experience
Ajay Gupta	Chief Manufacturing Officer (Sept 2018 to present)	33+ years
Prashant Potnis	Chief Scientific Officer (Sept 2019 to present)	25+ years
Pankaj Mehta	Joint President - Corporate Relations and Strategy Head (May 2020 to present)	38+ years
Harendra Pandya	Chief Projects and Procurement Officer (April 2019 to present)	29+ years
Manoj Sharma	Chief Human Resources Officer (Oct 2018 to present)	26+ years
Bhaskaran R	Head Design and Technology (April 2019 to present)	24+ years
Radhakrishnan D	Head Technology Development, (Sept 2019 to present)	18+ years

Source: Ambit Asset Management

iii. Deep pocketed Pharma players moving into Chemicals? Example of Natco Pharma: In Jan 2019 Natco Pharma (NTCPH) announced foray into Agro-Chem segment with the intent of leveraging its Active Ingredients R&D capabilities to diversify its revenue. Investments have been made in areas where Natco believed it had chemistry skills. The strategy here was similar to Natco's foray into formulations wherein it would be targeting patented agrochem molecules and try to be amongst the first wave of entrants. Initial focus was on India with eventual expansion to global markets. As of FY21, Natco had incurred a capex of >Rs100Cr on that segment.

11. India demand stolen away by peers like Indonesia, Malaysia,Mexico, Vietnam can be a large disruptor

CASE IN POINT: The story of Vietnam

Vietnam commenced the Doi Moi Reform process in CY86, way after China begun its reform process in the late 70s, but before India, which kick-started the process in CY91.

The country has since been on the path to growing its exports faster than India. Vietnam delivered total merchandise exports at an 18% CAGR in the last decade, excluding CY20 (v/s a meager 4% CAGR for India over this period).

More recent legislation as well has been supportive towards investments and export vs. India. As of June 2021 and According to recent data, of the 56 companies that have moved out of China since its trade war with the US over the last two years, only 8 have invested in India, while 26 have shifted base to Vietnam.

That said, Specialty chemical companies in India have an edge over Vietnam in terms of technology and niche expertise in respective chemical formulations.

12. Other Disruptors:Covid-19

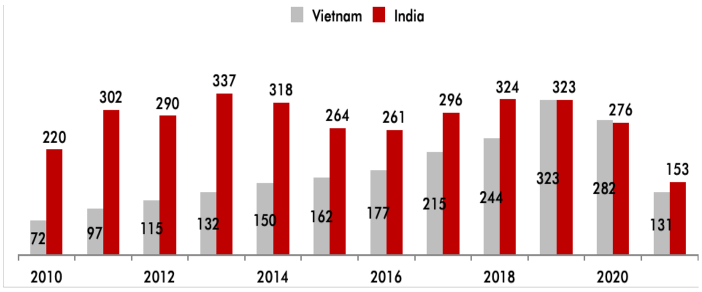
Unforeseen situations can be of many types like the global pandemic of Covid 19 that we have all been facing. While covid has caused a lot of human impact by loss of lives and physical and mental health, it has had a huge economic impact too. Many companies have had disruptions in order flow, delivery schedule, demand and also faced inability to conduct business. **Exhibit 31** outlines the impact that Covid 19 has had on the chemical industry during the varying rounds of disruption (1st wave, recovery, 2nd wave). The chemicals segment as a whole had been insulated to a large extent from covid due to the "essential" tag assigned to chemicals which allowed the companies engaged to conduct business.

Exhibit 29: Pharmaceuticals segment is 10x the size of chemicals and can have a huge potential opportunity for Indian chemical companies to enter into as an adjacent area

Parameters	Pharma	Agro-chemical	Organic Chemical	Inorganic Chemical	Color Alkali	Dyes & Pigments	Speciality Chemicals
Entry barrier	Very Strong	Very Strong	Weak	Weak	Weak	Weak	Very Strong
Regulatory approvals	High	High	Low	Low	Low	Low	Low
Customer profile	Toll manufacturing	Toll/ open arrangements	Open market	Open market	Open market	Open market / sticky	Toll/ open arrangements
Customer stickiness	Very High	Very High	Low	Low	Low	Moderate	Very High
Pricing	Fixed arrangements	Fixed arrangements with pass on clause	Market driven	Market driven	Market driven	Fixed arrangements	Fixed arrangements with pass on clause
No of suppliers for the same product	High	High	Low	Low	Low	Low	Low

Source: Ambit Asset Management, Company

Exhibit 30: Vietnam exports up 4x over last decade; no won par with India



Source: Ambit Asset Management, Company

Exhibit 31: Covid 19 has disrupted most industries, chemicals as a segment has been better insulated by the devastating impacts of covid due to the essential nature and requirement that chemicals have as an industry

Factors	March - April 2020	May 2020 onwards	May 2021 onwards
Manufacturing Activity	Essential products continued	Business as usual	Business as usual
Capacity utilization	Less than 50%	Essential at pre - covid levels, Others at 80%	>80%
Labour	High dependence on contract labor impacted significantly	Some challenges persist	Available and many part/fully vaccinated
Raw materials	Restricted trade flow and lower production in China led to supply shortage, dollar appreciation increased costs	Restoration of normalcy and opening up	Container shortages globally, exports continue but higher cost and some delays

Source: Ambit Asset Management

At Ambit we believe in wealth creation by long term equity investment and through the power of compounding. We constantly try and stay ahead of the curve on what may possibly impede the growth our portfolio companies. While Chemicals as a segment has bright prospects going ahead in India, we do a long term scenario analysis on what could be the possible disruptions to the company and the industry. We hope this note was able to impart to you **(1) The story of a new era of structural chemical growth and (2) Give you pointers to things to watch out for along the journey!**

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