This methodology note stands superseded. Refer to ICRA's website www.icra.in to view the updated methodology note on the sector.

Rating Methodology for Chemical Industry

Background

Chemicals can be broadly classified as organic or inorganic, each with a number of sub-segments, which in turn have their own unique characteristics and are governed by distinct sets of business fundamentals. However, for the sake of analytical convenience, ICRA segments the chemical industry into the commodity and specialty chemical businesses, each of which is characterised by different types of risk factors. Notable examples of commodity chemicals would be petrochemicals such as polyvinylchloride (PVC), high-density polyethylene (HDPE), low-density polyethylene (LDPE), polypropylene (PP) and methanol, and inorganic chemicals such as caustic soda and soda ash. Specialty chemicals, on the other hand, would include certain types of adhesives, catalysts, water treatment chemicals, leather chemicals, pigments, and surfactants. In reality, however, it is difficult to categorise chemical companies as pure specialty or commodity players, as most product offerings possess traits of both commodity and specialty chemicals.

Commodity chemicals are usually traded widely and exhibit cyclicality in demand and price, and hence companies that have a high dependence on such products are usually exposed to high levels of business risk. ICRA recognises the sensitivity of such companies to demand-supply fluctuations in individual product segments. However, the rating usually takes into consideration the company's cost competitiveness and its ability to generate and sustain cash flows that are adequate in relation to its debt service obligations, particularly during prolonged periods of weak product pricing.

Specialty chemicals, on the other hand, are niche products with specific product applications. In the specialty chemicals business, factors like technology, product patents and high development costs act as entry barriers, limiting competition and allowing relatively higher levels of profitability. However, such products can lose their niche status and get exposed to the risk of product obsolescence once alternative technologies and products come up.

ICRA's rating methodology for chemical companies is based on an objective assessment of industry level risks and entails evaluating the issuer company's operating, marketing, and financial position, besides its ability to generate cash flows from operations and the adequacy of the same in relation to its contractual debt service obligations. ICRA also assesses the issuer company's management for its growth plans, risk appetite, and financial policies.

Industry Risk Assessment

Commodity Chemicals: The industry risks that impact the commodity chemicals segment pertain primarily to the increasing linkage of the domestic market for these products to the global markets and the progressive reduction in the extent of duty protection accorded to the segment. ICRA's analysis of the commodity chemicals segment involves primarily an assessment of the global demand-supply position in the individual product groups, with the aim of identifying the likely

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demand and price trends in the medium term. ICRA also takes a view on the extent and nature of regulatory protection available to individual product groups and the likelihood of its sustenance in the foreseeable future. However, since most commodity chemicals are priced on an import parity basis, the devaluation of the Indian rupee against the US dollar provides some protection to the domestic players, partly mitigating the impact of declining protection levels. While historically Indian rupee has depreciated significantly against US dollar, Indian rupee has seen appreciation against the US dollar during the intervening periods as well and in such a scenario, the appreciation of Indian rupee against the US dollar does have an impact on the contribution and profitability for these entities in the chemical sector. Another source of risk for commodity chemical manufacturers is the threat of large-scale imports from low-cost producers like China. The situation is accentuated by the structural weaknesses within the domestic commodity chemicals segment, like a fragmented supply base, which lead to limited economies of scale, relatively high capital and interest costs, and limited availability of low-cost feedstock, factors that continue to adversely affect the segment's cost competitiveness. ICRA's rating assessment therefore also takes into account the overall cost competitiveness of the domestic commodity chemicals segment and the consequences of large-scale imports on the structure and viability of the players concerned, especially in a scenario of declining import duty protection.

Specialty Chemicals: The specialty chemicals industry, on the other hand, is exposed to a different set of industry risks, which emanate from the likely development of alternative technologies and applications and the resulting product obsolescence. The industry risks, in this case, are also closely associated with the dynamics of the end-user industries. A case in point would be the demand for certain oilfield chemicals that are used for oil exploration activity: a sudden reduction in exploratory activity because of low oil prices could severely affect demand. ICRA's assessment of industry risks involves an understanding of global trends in the use of such chemicals, and the stability of the technology and product application that drives their demand.

Operational Assessment

Commodity and specialty chemicals being associated with different risk profiles, ICRA evaluates the product mix of chemical companies for their ability to achieve revenue diversification. The ability to offer a broader array of products and services across market segments constitutes a competitive advantage. A portfolio of diverse products lowers business risks and the risk of product obsolescence or commoditisation in any one product line. A company offering a range of products addressing different buyer requirements is likely to have a better market position than a single-product company. ICRA believes that a higher proportion of specialty chemicals in the product mix can fetch better margins in the long term, given the relative price stability in these products; it may however call for sustained investments in research and client servicing.

(a) Commodity Chemicals

Considering the high vulnerability of the commodity chemicals business to price volatility in the international markets and the declining trends in duty protection levels, the operating profitability of this business hinges on its ability to sustain a competitive cost structure. The cost structure of a commodity chemicals company is a function of a number of factors, including feedstock cost, technology, economies of scale, and level of vertical integration. ICRA analyses each of these factors to determine the cost-competitiveness of the company concerned.

Feedstock Risks

Given that raw material cost is the single largest component of the cost structure of a chemical company, issues related to the availability and pricing of raw materials have a critical bearing on its operating performance. Availability is particularly important, considering that most chemical

companies operate continuous process plants and an unplanned shutdown can have severe cost implications. In this context, ICRA evaluates the candidate company's sources of raw material supply, supplier concentration risk, its bargaining power relative to the feedstock supplier, and the pricing structure. ICRA also assesses the regulatory risks associated with the pricing of certain key raw materials, such as natural gas, the increase in price of which can have a significant impact on the cost structures of companies using it as a primary feedstock. The cascading effect of Central and sales taxes, and transportation costs also have an impact on the delivered cost of the feedstock and could have a material impact on the cost competitiveness of a chemical company.

Operating Risks

In rating a chemical company, ICRA also assesses the technology adopted by the company, its process efficiencies, product yields, and history of planned and unplanned outages. Usually, access to process technology has not been a major issue for chemical companies as the technology has achieved a certain degree of standardisation. ICRA however evaluates the candidate company's ability to absorb the technology adopted and stabilise the operating parameters within the design norms. ICRA also assesses the company's technical ability through in-house research & development efforts in order to improve the process efficiency in existing operations as well as to develop new products so as to diversify the presence & sustain growth. ICRA also assesses the yield levels relative to other players operating in similar product segments; however, such evaluation may at times be constrained by the lack of availability of comparative data. Chemical process plants are also prone to accidents, and the rating process involves understanding the safety and risk management practices of the company, its track record in safety, and the suitability of insurance covers for the relevant risks.

Economies of Scale

The chemical industry being capital intensive, achieving economies of scale and having a competitive cost structure are of considerable importance. The ability to maintain high capacity utilisation levels is influenced by factors such as favourable demand levels, extent of cost competitiveness and availability of feedstock. When there is overcapacity in the domestic industry, exports could help in maintaining high capacity use. However, exports may also fetch lower margins in the absence of duty protection. An efficient producer can address this risk by recovering all fixed costs through domestic sales and operate on a marginal costing basis for exports.

Level of vertical integration

A high level of vertical integration lowers earnings volatility and reduces raw material costs. Globally, there is little merchant trade in petrochemical building blocks such as ethylene and propylene. Thus, plants dependent on external supplies of these chemicals are exposed to high business risks in the form of price volatility. While high level of vertical integration leads to higher proportion of fixed costs and high capital expenditure, it could also improve profitability in an environment of escalating input prices. On the contrary, if intermediates prices in the market are lower than captive production due to supply-demand mismatches, that can impact the overall profits of vertically integrated companies, unless they have the flexibility to use market sourced intermediates, through either imports or domestic purchases. Overall, a high degree of vertical integration provides the flexibility in sourcing such inputs in a volatile raw material price environment & also control over such costs in the long run of the plant life.

Price and tolling margin trends

Since the prices of both the finished products and the feedstock tend to be volatile, it is critical to look at the trends in tolling margin to understand the impact of such volatility on the profitability of a chemical company.

Locational factors

For low-value chemical commodities such as chlor alkali products (caustic soda, chlorine, soda ash) the locational factor, among others, could play a significant role in determining the competitive advantage of a chemical company. As the freight cost as a percentage of the landed cost to the final consumer can be high if the product is transported from a longer distance, proximity to major end-users could impart strength to the manufacturer. For units producing high-value commodities, proximity to raw material sources (examples: petrochemical units located near a refinery; alcohol-based chemical units located in a sugar belt; and units dependent on imported raw materials located near a port) could impart competitive advantage via competitive feedstock costs.

Environmental issues

ICRA accords high importance to the pollution control systems employed by a chemical company, especially in a scenario of increasing awareness about pollution related hazards. In the past, several chemical plants have been shut down internationally, having failed to comply with the relevant pollution control norms. The trend in complying with the norms of the local pollution control board can give insights into the environmental pollution abatement systems implemented by a chemical company. Given that environmental regulations are becoming stricter in India with rising concerns on pollution, they are likely to have an impact on the kind of investments a chemical company would need to make to ensure compliance with environmental standards. In this context, ICRA assesses companies' compliance with environmental norms (which could be by way of either zero discharge or effluent discharge in line with the stipulated parameters) and ability to sustain the same, given that any deviation in compliance could lead to disruption in their operations until they are remedied.

(b) Specialty Chemicals

In the specialty chemicals business, the operating position of a company is driven by its ability to consistently deliver value-added products to the market. Although sensitivity to prices is lower in this segment as compared with that in commodity chemicals, cost economics cannot be altogether ignored in this case as specialty chemicals also get commoditised within a few years post-launch because of duplication by others. The following issues are therefore of primary importance when assessing the long-term fundamentals of a specialty chemical business.

Sustainable technology position

ICRA focuses on the complexity of the technology used by the company to assess the extent of entry barriers present in the segment. The more complex the technology, lesser the possibility of re-engineering, and therefore lower the probability of the product becoming a commodity within a short span of time. In this context, ICRA also analyses the technological capabilities of the company concerned, evaluating the quality of manpower in its R&D department, its track record in filing patents, and the support it gets from its technologically advanced parent, if any. ICRA also analyses the company's track record in introducing new products and sustaining volumes and margins.

Ability to commercialise new value-added products

A specialty chemicals company may have a large number of products in the pilot plant stage. In that case, ICRA analyses the company's ability to successfully launch these products and secure market acceptance for the same. The trends in the share of the new products to the overall sales are also important to understand the track record of new product introduction.

Concentration Risk

Specialty chemicals being niche products are developed for a few customers, which exposes the chemical company concerned to customer concentration risk. This risk assumes critical importance when the customer either goes through a business downturn or phases out production of a product line that requires use of specialty chemicals.

Management Quality

All debt ratings necessarily incorporate an assessment of the quality of the issuer's management, as well as the strengths/weaknesses arising from the issuer's being a part of a "group". Also of importance are the issuer's likely cash outflows arising from the possible need to support other group entities, in case the issuer is among the stronger entities within the group. Usually, a detailed discussion is held with the management of the issuer to understand its business objectives, plans and strategies, and views on past performance, besides the outlook on the (issuer's) industry. Some of the other points assessed are:

- Experience of the promoter/management in the line of business concerned
- Commitment of the promoter/management to the line of business concerned
- Attitude of the promoter/management to risk taking and containment
- The issuer's policies on leveraging, interest risks and currency risks
- The issuer's plans on new projects, acquisitions, expansion, etc.
- Strength of the other companies belonging to the same group as the issuer
- The ability and willingness of the group to support the issuer through measures such as capital infusion, if required

Financial Evaluation

The financial evaluation of a chemical company involves assessment of its cost structure relative to that of its competitors and also the sensitivity of its cash flows or debt servicing ability to weak product pricing, increasing input costs, and lower levels of duty protection. For specialty chemical companies, ICRA would evaluate the stability of their operating margins over a period of time to ascertain the extent to which their pricing power has remained intact. For commodity chemicals, in general, a company with superior economies of scale and efficient utilisation of by-products would have a lower cost of production than a smaller company. As ICRA attempts to rate commodity chemical companies through the economic cycle, the average tolling margin for the past two to three cycles is also analysed, besides trends in the long-term average of other credit metrics such as Operating Margins, Return on Capital Employed (RoCE) and debt coverage indicators. Further, ICRA evaluates the asset turnover ratios for such companies to assess their utilisation of capacity, after making suitable adjustments related to vintage of manufacturing plant.

For a multi-product company, ICRA evaluates the trends in product-wise profitability to determine the adequacy and sustainability of cash flow generation, given the debt service obligations. ICRA also measures the projected profitability of the entity by the returns on capital employed [Profit before Interest and Tax/two-year average of (Total Debt + Tangible Net Worth + Minority Interest + Deferred Tax Liability – Capital Work in Progress – Capital Advances)] relative to the cost of capital, which would be a good indicator of its long-term sustenance. The commodity chemical business is capital intensive, which underscores the importance of the capital structure in determining the credit risk profile of the participant in this business. The ability of a company to maintain conservative gearing levels would serve to counter the high business risks associated with commodity chemicals. However, a multi-product company is also expected to continually upgrade/add new capacities (for commodity chemicals) or invest substantially in R&D and product development (for specialty chemicals) so as to be able to meet its growth aspirations. ICRA assesses the sufficiency of internal cash generation vis-à-vis capital expenditure requirement and product development expenditure, the need for the company to raise capital from the market, and the implications of the same on its future capital structure.

Some of the other aspects that are also analysed for both commodity and specialty chemical companies include the following:

- **Foreign currency related risks*:*** Such risks arise if an issuer's major costs and revenues are denominated in different currencies. Examples in this regard would include companies selling in the domestic market but having large imports, and export oriented units operating largely on the domestic cost structure. The foreign currency risk can also arise from unhedged liabilities, especially for companies earning most of their revenues in local currency but having unhedged foreign currency borrowings which could pertain to part-funding of capital expenditure and/or working capital requirements. The focus here is on assessing the natural hedge available as well as hedging policy of the issuer concerned in the context of the tenure and nature of its contracts with clients (short term/long term, fixed price/variable price) to mitigate such risk for net foreign currency exposure.

- **Liquidity & Financial Flexibility:** Issuer entities with low to moderate scale of operations which mainly account for majority of the rated universe in the chemical sector remain exposed to risk of cash flow mismatches, particularly in case of increased competitive pressures affecting margins, adverse volatility in input price levels, any deterioration in the business environment affecting volumes and increased working capital requirements. ICRA assesses the issuer's liquidity by analysing the month-wise utilisation pattern of both fund based and non-fund based limits over the last 12-18 month period as well as the extent of drawing power available with the issuer. Moreover, ICRA also evaluates the strength of the entity's relationship with banks, financial institutions and other intermediaries, which is a key factor for the timeliness in sanction of working capital funds to the entity. Also, the issuer's financial flexibility—as reflected by its unutilised bank/credit limits, liquid investments, as well as financial strength of promoter group to infuse funds (either equity capital or unsecured debt) to meet cash flow shortfall, is assessed.

- **Adequacy of Future Cash Flows:** Since the prime objective of the rating exercise is to assess the adequacy of the issuer's debt servicing capability, ICRA draws up projections on the likely financial position of the issuer under various scenarios. Future cash flows are projected after taking into account the company's capacity utilisation levels, likely prices of raw materials and finished products, the growth it envisages for itself, debt repayment schedule, its funding requirements, and the funding options available to it. These cash flows are then used to determine the company's future debt servicing capability under various scenarios. In the cash flow projections, ICRA also analyses the other ratios used to assess cash flows such as Fund Flow from Operations (FFO) debt coverage and Retained Cash Flows (RCF) debt coverage, to arrive at the credit rating.

- **Tenure mismatches, and risks relating to interest rates and refinancing*:*** Large dependence on short-term borrowings to fund-long term investments can expose an issuer to significant re-financing risks, especially during periods of tight liquidity. The existence of adequate buffers of liquid assets/bank lines to meet short-term obligations is viewed positively. Similarly, the extent to which an issuer would be impacted by movements in interest rates is also evaluated.

- **Accounting quality**: Here, the Accounting Policies, Notes to Accounts, and Auditor's Comments are reviewed. Any deviation from the Generally Accepted Accounting Practices is noted and the financial statements of the issuer are adjusted to reflect the impact of such deviations.

- **Contingent liabilities/Off-balance sheet exposures**: In this case, the likelihood of devolvement of contingent liabilities/off-balance sheet exposures and the financial implications of the same are evaluated.

Summing up

ICRA takes a case-by-case approach to evaluating the credit risk profile of chemical companies, considering the diversity in their product lines and market dynamics. While the cost structure, level of vertical integration, and diversity of product mix would ultimately determine the business risk profile of a commodity chemical company, use of sustainable technology and ability to introduce new products consistently would have a strong bearing on the business risk profile of a specialty chemical company. ICRA's financial risk analysis for commodity chemical companies focuses on profitability through commodity price cycles, the extent of leverage, ability to service the debt during a downcycle, and financial flexibility. With regard to specialty chemical companies, stability in profitability is analysed to understand the pricing power, apart from other factors.

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