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Rating Methodology by Sector

Chemicals

*This rating methodology is a modification of the rating methodology made public on July 13, 2011, and modifications are made to the key financial indicators in narrowing down these indicators by significance as part of clarification of rating methodology.

1. Business base

(1) Characteristics of the industry

(i) Market overview

In general, the chemical industry is broadly divided into commodity chemicals, which includes general-use petrochemical and inorganic chemical products, and specialty chemicals, which includes a wide range of products, but the main products are paints, inks, adhesives, perfumes, information and electronic materials, functional materials developed for such specific purposes as automobiles, and life science materials (medicine and agricultural chemicals).

Although the profitability of commodity chemicals tends to be lower than that of specialty chemicals, profit levels can be maintained by selling the products in large quantities. Commodity chemicals have broad application and demand is expected to increase in line with market growth, led by global economic growth, particularly in relation to emerging countries. In the short run, however, demand is susceptible to business fluctuations. Market conditions for both the cost of raw materials and product prices are based on supply and demand, which may fluctuate substantially. Trends in prices of raw materials and finished products do not necessarily coincide, and the spread (the difference between the price of raw materials and the price of a finished product) generally tends to be unstable. Because of this, the volatility of commodity chemicals is considered to be relatively high.

The overall market for information and electronic materials constituting a major product line of specialty chemicals is expected to grow. Looking at individual products, however, some are exposed to the risk of shorter product life cycles due to continuing technological innovation. In general, the profit margin is large, based on advanced technical skills. In some cases, however, the demand for lower prices increases every year, depending on customer trends. Pharmaceutical businesses run by chemical companies tend to be positioned as a stable income source, as fluctuations in demand are relatively small in comparison to other businesses. However, the effects of competition with generic drugs and the prescription drug price revisions implemented every other year cannot be avoided. While the level of investment in production facilities in these businesses is often lower than in the case of commodity chemicals, continuous investment in research and development is needed to improve and maintain technical capabilities. In certain information and electronic materials, capital expenditure is required to respond to rapid market growth.

(ii) Competitive situation

Businesses in the production and consumption of commodity chemical products face global competition. Large, new plants, using ethane—a major component of natural gas that is far less costly than naphtha—are being built, one after another, in the Middle East, and the petrochemical industry is viewing this development as a major competitive risk. Many domestic chemical companies are aiming to avoid the competition by shifting to high-value-added products as well as by strengthening their ethylene plant management. JCR evaluates these strategies.

Competition is not prevalent in a specialty chemical business when a large market share is maintained through a company's original technical capabilities that are de facto standards. In most cases, however, various types of competition arise at each stage of product growth. At the initial stage, a product faces competition in the establishment of a technology. At this stage, there is a risk that the product will not be continuously adopted by the users, which tends to be a restrictive factor in assessing credit rating. In the product growth stage, increased sales in response to growth in demand for the product can be expected. However, many competitors expand their production capacity to capture the demand, which often increases the burden of debt. In addition, when an item enters the stable product phase, it is required to note that that there is a risk that an increasing number of competitors will catch up with the required technological level, intensifying the price and other types of competition while reducing the profit margin.

Competitive situations and supply and demand can vary, depending on the product, both in the commodity chemical and specialty chemical sectors. In some cases, extreme price competition is initiated by specific entrants for individual products, and risk assessment must be made individually for each product.

(iii) Cost structure

Generally, cost controls for commodity chemicals by each company alone are limited, and deterioration in the external environment tends to cause a substantial fall in revenue. In particular, the industry is a process industry, characterized by a heavy burden of fixed costs due to relatively inflexible facility operations. The cost of raw materials is easily affected by market conditions.

(iv) Risk associated with policy

Business in commodity chemical is large in size, which makes the effect of policy changes, such as those relating to taxation, significant. In particular, the petrochemical industry emits a large amount of greenhouse gases, and the possible imposition of various taxes and other public charges has been brought up for discussion in the past. Although no specific regulations that could cause a substantial burden have yet been adopted, the direction of such discussion must be continuously watched.

(2) Key factors in market position and competitiveness

(i) Market position

The market position of commodity chemicals has a significant effect on the competitiveness of a company, as the larger the size of market share, the easier it is to achieve both economies of scale in terms of cost and greater control of market conditions.

In specialty chemicals, too, the market position is important; a large market share in a specific area backed by technological strengths helps maintain stable business relationships with customers and ensures profitability.

(ii) Business portfolio

In the chemical industry, the business risk often varies, depending on the type of business and product. The credit rating, therefore, focuses on whether the profit is stabilized and risk controlled by appropriately combining businesses with different risks. More specifically, JCR checks the competitiveness of businesses that could be the main force and the presence of stable income sources. In addition, the business risk of the entire company is assessed in view of whether the income sources are diversified and whether a good balance between businesses with high risk and those with controlled risk is maintained, among other factors. Moreover, JCR is determining the types of functions and roles played by each business and how the overall profit structure is built.

(iii) Capturing demand and maintaining facility operation

Commodity chemical businesses generally require large capital expenditures, which makes it important to appropriately capture the demand and maintain a high rate of facility operation. For this reason, the prospective demand for key products, customer relations, operational structure, and selling power, along with other factors, must be confirmed when assessing the competitiveness of each company. For ethylene plants, JCR pays attention to inter company relationships and positioning among the plants when determining these factors. As for overseas production bases, conditions in terms of cooperation with local manufacturers are also considered.

(iv) Cost-competitiveness

Because most commodity chemical products are hard to clearly differentiate using technology, competition relies heavily on cost competitiveness. The cost of procuring raw materials generally depends on market conditions and so doesn't really vary among individual companies. Cost competitiveness is affected by competitiveness based on production facilities and manufacturing processes.

For facilities, such conditions as the location, status of supply chain management (SCM) of both upstream and downstream processes, and production efficiency of the facilities must be confirmed.

Petroleum chemistry is generally managed from the upstream olefin products to various derivatives as a supply chain, which, in many cases, also includes the products processed downstream. Some ethylene plants are connected with the derivative plants of other manufacturers, and product composition, from upstream to downstream stages, considerably affects cost-competitiveness. The effective use of facilities is leveraged not only by individual companies, but in cooperation with other companies that have been achieving measurable progress. JCR is also monitoring the development of such activities.

Some chemicals, though identical substances, can be produced with different raw materials and by different methods. In case such differences in the manufacturing methods result in varied cost-competitiveness, JCR confirms that.

(v) Investment strategy

Commodity chemicals are a process industry, which tends to require large and sustained capital expenditures. Specialty chemicals often require substantial investment in research and development to continuously improve the level of technology. Further, mergers and acquisitions are frequently undertaken for the purpose of expanding the business size and acquiring the high technologies. Consequently, the way limited management resources and funds are allocated to different businesses largely affects a company's credit rating.

JCR first checks the perceived level of investment considered constantly necessary to maintain competitiveness and the management guidelines and policies concerning the balance between growth strategy and improvement of financial structure. If there are large investment projects, JCR individually confirms such factors as the details of the investment, the overall picture of the company after making the investment, synergy with the existing business, the method of funding the investment, and potential return on the investment, which are subsequently applied to the credit rating.

2. Financial base

(1) Business size

In commodity chemicals, JCR focuses on the indicators related to the business size or a market position, which have a significant effect on the competitiveness of the company.

For all chemical companies, in addition to the indicators of the entire company, indicators in each segment and conditions of key product are monitored as well.

Key financial indicators:

- Net revenue

(2) Earnings strength

In view of expanding and maintaining a business, JCR pays attention to its earnings strength. JCR's emphasis on the status of the business portfolio leads to its attention to the earning trends in each segment. Because the profit from commodity chemicals fluctuates relatively rapidly, trends over several years, rather than that of only one accounting period, are assessed within one business cycle.

In the business of commodity chemicals, maintenance of a spread and production efficiency constitute important factors of competitiveness. Meanwhile, the rate of return from specialty chemicals often reflects the technological level and competitiveness. Therefore, JCR monitors the rate of return in each segment.

Key financial indicators:

- ■ Operating income
- ■ Ordinary income
- ■ Operating margin
- ■ EBITDA margin rate
- ■ Return on assets

(3) Cash flow

Considering the constant financing and investment in this industry, generation of adequate cash flow as an outcome of investment and availability of the cash flow for appropriate allocation for the repayment of borrowings must be confirmed.

Key financial indicators:

- ■ EBITDA
- ■ Cash flow from operating activities
- ■ Free cash flow
- ■ Ratio of interest-bearing debt to EBITDA

(4) Safety

Despite the efforts of chemical companies to control their business risk by building a business portfolio and diversifying their income sources, the risk has not been adequately reduced. In assessing credit rating, therefore, JCR focuses on financial stability, particularly the amount of equity capital, as a buffer for the emergence of risk.

Many of the assets held by each company are relatively susceptible to value fluctuations, and, thus, the asset soundness must also be watched. Examples of the high risk of reduced asset value include the stock of commodity chemicals in a volatile market, manufacturing facilities for individual products with a very relaxed balanced between supply and demand, and goodwill associated with an acquisition. Moreover, constant changes are made to the business portfolios, which may cause the risk of a loss from business restructuring. The amount of equity capital is important also as a buffer for such risks.

Since constant capital expenditure, investment in research and development, and other spending are required and the investments to strengthen competitiveness have been increasing in recent years, the ability to maintain a financial structure that allows efficient financing is emphasized. Assessment of these indicators considers the differences in the characteristics of each business. For instance, commodity chemicals tend to carry a heavy burden of investment, which is recovered over a long period of time. Specialty chemicals, on the other hand, require less burden of investment, which is often recovered in a relatively short period of time.

Key financial indicators:

- Shareholders' equity
- Equity ratio
- Debt equity ratio
- Interest coverage ratio

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