

## Rating Methodology by Sector

### **Nonferrous Metals**

While the nonferrous metals industry includes smelters of copper, zinc, lead, nickel, and other metals, aluminum processing companies (plate, extrusion, and foil manufacturers), and manufacturers of electric wire and other products, JCR covers the smelters of these metals in this rating methodology.

#### 1. Business base

The performance of nonferrous smelters tends to fluctuate depending on nonferrous metal market conditions and exchange rate trends. In addition, the scale of investment in mines is often large, and in some cases, large impairment losses are recorded when mining operations are sluggish. For these reasons, in assigning ratings, JCR focuses on whether a company's mines and smelters are highly competitive, whether it has built a business foundation that is profitable even in fluctuating market conditions, and whether its business portfolio is diversified enough to limit fluctuations in companywide performance.

#### (1) Characteristics of the industry

##### (i) Market overview

Copper is processed into electric wires, wrought copper and copper alloy products, etc. for use in construction, electrical equipment, industrial machinery, automobiles, and others. Zinc is processed into galvanized steel sheets, brass, zinc die-cast alloys, etc. for use in construction, automobiles and others. Lead is used in lead-acid battery electrodes, radiation shielding materials, soundproofing materials, etc, while nickel is used in stainless steel, lithium-ion secondary batteries, etc.

Copper, which has a wide range of applications, is the most widely consumed metal worldwide, followed by zinc, lead, and nickel. Although demand for all these metals is affected by business fluctuations, it is on an increasing trend over the medium to long term. Nonferrous metal production in Japan exceeds domestic consumption, and these metals are exported to China and other Asian countries.

Trading prices are announced by the London Metal Exchange (LME), and refined metals are traded based on the LME price. LME-designated warehouses are located around the world, and changes in their inventories reflect local supply and demand, which in turn affect the LME prices. However, in addition to actual supply and demand trends, the LME prices can also fluctuate significantly due to inflows of speculative funds. Furthermore, metals may be substituted by other metals, as in the past where some of the raw materials were shifted from gold to copper for bonding wire and from nickel to chromium for stainless steel, respectively, when those nonferrous metals prices soared.

##### (ii) Competitive situation

Major nonferrous smelters are engaged in smelting business by owning their own smelters or by investing in

a joint toll smelter. Competition within Japan is limited due to the separation of nonferrous metals by type and user. On the other hand, in Asia, their main export market, they compete with highly competitive Chinese and Korean smelters, and thus the profitability tends to be lower than that of the domestic market.

Global competition is intensifying in the collection of recycled raw materials, mainly E-Scrap (waste substrates for electronic equipment). It is necessary to confirm whether each company is collecting the necessary amount of recycled materials by expanding its overseas collection bases.

### (iii) Cost structure

In the case of copper, the ore cost paid by smelters to mining companies is the LME price minus refining costs (TC/RC = treatment/refining charges). On the other hand, the price of refined metals sold by smelters to customers is the LME price plus a premium (surcharge) that reflects transportation costs and local supply and demand. Therefore, smelters' revenues are the sum of refining costs and premiums converted into yen, plus revenues from by-products such as sulfuric acid, copper slag, and precious metals. Therefore, trends in negotiations between mining companies and smelters on refining costs (ore purchase terms) have a significant impact on their earnings.

Although processes at smelters differ slightly depending on the metals to be smelted and refined and smelting and refining methods, all smelters have furnaces and other large facilities, and make investments for periodic repairs, capacity expansion, and efficiency improvement. As a result, the fixed cost burden, including depreciation and amortization, is high.

The cost of ore production is increasing due to higher and deeper ore deposits in overseas mines and tightened environmental regulations by local governments. In addition, the number of high-grade ores is decreasing. For these reasons, JCR conducts interviews with smelters on the operation status, cost trends, and ore grades of the mines in which they have invested.

## (2) Key factors in market position and competitiveness

### (i) Market position

Since smelters are generally more cost competitive the larger the scale of production, JCR confirms their production volume and market share. In addition, some Japanese smelters have invested in smelters not only in Japan but also in East Asia, so JCR looks at the overall supply capacity of the group as a whole as a factor in its judgment.

### (ii) Upstream development

The oligopoly of nonferrous majors and rising demand for ore in emerging countries have strengthened the voice of mines' sides. In order to stably procure ore, it is important to expand into the mining business, which is upstream of the smelting business. By increasing the ratio of ore procured from mining interests to the overall volume of ores procured (proprietary ore ratio), the company can secure procurement routes and also capture profits from the mines in its financial results.

When investing in a mine that is already in operation, the business risk is small, but the amount required to acquire the interest becomes large. On the other hand, when starting from exploration, the investment amount is relatively small, but a long period of time is required before commercialization. Even after commercialization, there is a possibility that the minable ore volume and mining costs will differ from assumptions based on exploration results, and in some cases, additional environmental investment will be required, and business risk is large. In addition, changes in local government policies, such as stricter ore export regulations and higher tax rates, may affect the earnings strength of mining operations.

Given these factors, JCR analyzes mining investment projects from the perspectives of business risk, including country risk, total investment amount and payback period, progress of the project, and changes in the proprietary ore ratio after the mine goes into operation or after the acquisition of the interest.

### (iii) Technical strengths

JCR focuses on whether the company has the technology to efficiently recover valuable metals in its smelting operations. The company is expected to raise its earnings strength by recovering and selling many types of valuable metals. In addition, recycled raw materials contain many impurities, which can easily cause production problems. Technology to properly treat impurities is important to expand the use of recycled raw materials.

In addition to mining technology in the mine development stage, the mining business requires a variety of know-how including that for handling impurities in ore and dealing with adverse weather conditions even after operations begin. JCR assesses whether each company has these technologies and is able to operate the mines smoothly.

### (iv) Business structure

The share of smelting and mining operations in net sales and operating income varies from company to company. There are also some differences in the businesses other than smelting and mining. In addition to the market size, growth potential, market share, and competitive situation of each business, JCR also checks whether the company as a whole is able to control fluctuations in its business performance.

Of the businesses other than nonferrous smelting and mining, in the electronics related business, in which many companies are engaged, products are fast becoming commoditized, and competition with Asian companies in South Korea, Taiwan, and China is fierce. Therefore, continuous R&D and sales of new products are required. In addition, in the automotive related business, growth in domestic automobile production is unlikely and automakers and parts manufacturers are severely demanding lighter weight and cost reductions, so JCR believes that its abilities to develop products that meet user needs, expand overseas development, and be cost competitive are important.

## 2. Financial base

### (1) Earnings strength

JCR places importance on earnings strength from the perspective of maintaining and expanding business. However, since the company is susceptible to the effects of nonferrous metal market conditions and exchange rate fluctuations, JCR evaluates it within a certain cycle, rather than examining it based on the only results of one fiscal period. As the mining business tends to have a large impact on business performance, JCR looks at the profit contribution from this business including the equity in earnings of affiliates. In addition, JCR focuses on whether the company has an earnings strength that can secure a certain level of profit even when the nonferrous metal market declines, through diversification of its business portfolio and other measures.

Key financial indicators:

- Operating income and ordinary income
- Equity in earnings of affiliates
- ROA

## (2) Cash flow generation capacity

In addition to the constant burden of investment for facility renewal, the acquisition of mining interests often requires a large amount of funds. It is necessary to confirm that each company's investments are generating results as planned and the repayment of external debt is progressing using the generated cash flow. While a temporary increase in interest-bearing debt is inevitable with acquisitions of mining interests and other activities, JCR focuses on whether the company has an ability to generate enough cash flow to restore its financial structure to the previous financial structure over the medium term.

Key financial indicators:

- Cash flow from operating activities
- Cash flow from investing activities
- Ratio of interest-bearing debt to EBITDA

## (3) Safety

Nonferrous smelters are subject to significant performance volatility and need to maintain a certain level of financial soundness as a buffer in the event of performance deterioration. It is also important to ensure a sound financial structure from the perspective of enabling smooth financing in situations where large cash outflows are required, such as mining investments. In analyzing these indicators, JCR does not only focus on temporary levels, but also takes into account their financial management policy and medium- to long-term trends before reflecting them in the rating.

Key financial indicators:

- Interest-bearing debt
- Equity capital and equity ratio
- Debt equity ratio



---

Because of the possibility of human or mechanical error as well as other factors in the information herein, JCR makes no representation or warranty, express or implied, as to accuracy, results, adequacy, timeliness, completeness or merchantability, or fitness for any particular purpose, with respect to any such information, and is not responsible for any errors or omissions, or for results obtained from the use of such information. Under no circumstances will JCR be liable for any special, indirect, incidental or consequential damages of any kind caused by the use of any such information, including but not limited to, lost opportunity or lost money, whether in contract, tort, strict liability or otherwise, and whether such damages are foreseeable or unforeseeable. Information herein is statements of opinion, and not statements of fact as to credit risk decisions or recommendations regarding decisions to purchase, sell or hold any securities such as individual bonds or commercial paper. JCR retains all rights pertaining to this document. Any reproduction, adaptation, alteration, etc. of this document, is prohibited, whether or not wholly or partly, without prior consent of JCR.

## Japan Credit Rating Agency, Ltd.

Jiji Press Building, 5-15-8 Ginza,  
Chuo-ku, Tokyo 104-0061, Japan  
Tel. +81 3 3544 7013, Fax. +81 3 3544 7026

---