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## Key Credit Factors For The Metals And Mining Upstream Industry

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# Key Credit Factors For The Metals And Mining Upstream Industry

*(Editor's Note: This criteria article supersedes "Key Credit Factors: Methodology And Assumptions On Risks In The Mining Industry," published June 23, 2009, and "Methodology And Assumptions: Streaming Transactions," published Oct. 10, 2013.)*

1. Standard & Poor's Ratings Services is refining and adapting its methodology and assumptions in its key credit factors for the global metals and mining upstream industry. We are publishing this article to help market participants better understand the key credit factors in this industry. This article is related to our global corporate criteria (see "Corporate Methodology," published Nov. 19, 2013, on RatingsDirect) and to our criteria article "Principles Of Credit Ratings," which we published on Feb. 16, 2011.
2. These criteria supersede "Key Credit Factors: Methodology And Assumptions On Risks In The Mining Industry," published June 23, 2009, and "Methodology And Assumptions: Streaming Transactions," published Oct. 10, 2013.

## SCOPE OF THE CRITERIA

3. These criteria apply to ratings on issuers in the global metals and mining upstream industry (referred to as "upstream" or "mining" for the purpose of this criteria), defined as companies that derive the bulk of their revenues from the exploration and production (extraction) of metals and minerals. For companies that refine, process, and distribute the same metals and minerals ("downstream"), or mining companies that are integrated with downstream steel or aluminum operations that we treat as vertically integrated producers, we apply the key credit factors outlined in "Key Credit Factors For The Metals And Mining Downstream Industry," published Dec. 20, 2013.

## SUMMARY OF THE CRITERIA

4. Standard & Poor's is updating its global criteria for analyzing mining companies by applying Standard & Poor's global corporate criteria.
5. We view mining as a "moderately high-risk" industry under our criteria, given the industry's "high" cyclicality and "intermediate" competitive risk and growth. In assessing a mining company's competitive position, we put particular emphasis on the following factors:
  - Operating efficiency, including cash cost profile and scale, scope, and diversity of operations (notably the size and number of mines);
  - Concentration in a particular high-risk jurisdiction; and
  - Product diversity.
6. Our assessment of a company's financial risk profile takes into account ratios for the past two years and forecasts for the current year and two subsequent years based on Standard & Poor's price assumptions for metals derived from the

"Methodology For Standard & Poor's Metals And Mining Price Assumptions," published Nov. 19, 2013. For a company with significant exposure to a metal or bulk commodity for which we do not have price assumptions, we develop a set of prices for the next three years based on forward curves for the commodity, if available, and our expectations for demand/supply balance in the industry. We complement the analysis of the cash flow coverage ratios with our view of the company-specific volatility of cash flow and the capital expenditure program, both of which tend to be significant in the industry.

## IMPACT ON OUTSTANDING RATINGS

7. We do not expect these criteria, in and of themselves, to result in any rating changes. See our global corporate criteria for the impact on ratings for this industry.

## EFFECTIVE DATE AND TRANSITION

8. These criteria are effective immediately on the date of publication.

## METHODOLOGY

### Part I--Business Risk Analysis

#### Industry risk

9. Within the framework of Standard & Poor's general criteria for assessing industry risk, we view mining as a "moderately high-risk" industry (category 4). Our industry risk assessment for mining is derived from our view of the segment's "high" (5) cyclicality and "intermediate" (3) competitive risk and growth.

#### Cyclicality

10. The high cyclicality results from both demand volume and pricing volatility. This is because demand for metals and bulk commodities comes primarily from industries that produce discretionary consumer and capital goods, such as construction, automotive, and mechanical engineering, and which tend to demonstrate significant cyclicality. We believe medium-term cyclicality of the mining industry will be influenced by concentration of demand for many metals and bulk commodities in one country--China--which is now responsible for more than 40% of global demand for many of them.
11. Cyclicality is exacerbated by excess supply from large-scale capacity additions. High prices and margins during good times stimulate existing companies and new entrants to start large, long-lead-time projects, leading to periods of industry overcapacity that can last for years. This happened in the nickel market, for example, when record nickel prices in 2007 and 2008 triggered an increase in nickel pig iron capacity in China and high-pressure, acid-leach capacity elsewhere. This led to production consistently exceeding consumption for a number of years, pushing inventory higher and constraining prices below marginal producers' costs.
12. We assess the mining industry's overall cyclicality as "high" (5) based on our view that, relative to other industries, the

mining industry has "moderately high" cyclicalities of revenues but "high" cyclicalities of profitability, the two key measures we use (see "Methodology: Industry Risk," published Nov. 19, 2013). Based on our analysis of global data from Compustat, mining companies have experienced average peak-to-trough percentage declines in revenue and EBITDA margin of 13% and 30%, respectively, during recessionary periods since 1952. During the 2007-2009 recession, declines were even higher, at 21% and 56%.

13. We generally believe that the higher the cyclicalities in an industry's profitability, the higher the credit risk for entities in that industry. However, the overall effect of cyclicalities on an industry's risk profile may be mitigated or exacerbated by the industry's competitive risk and growth.

### Competitive risk and growth

14. We view the mining industry's competitive risk and growth as "intermediate" (3). To arrive at this assessment, we look at four sub-factors as low, medium, or high risk. These sub-factors are:

- Effectiveness of barriers to entry;
- Level and trend of profit margins;
- Risk of secular change and substitution by products, services, and technologies; and
- Risk in growth trends.

15. **Effectiveness of barriers to entry: Medium risk.** The main barrier to entry in the mining industry is the increasing scarcity of reserves, as many of the new deposits are in high-risk countries. However, the scarcity differs by commodity. Copper reserves (similar to oil) are generally viewed as scarce, whereas iron ore tends to be generally abundant, with supply constrained largely by lack of infrastructure.
16. Another barrier is the high capital intensity. Construction of a new mine often costs hundreds of millions, or billions, of dollars; engineering and construction last for years; and the owner is also often required to build infrastructure such as railroads or ports. Nevertheless, technological know-how required to build mines, smelters, and accompanying infrastructure is generally available.
17. **Level and trend of profit margins: Medium risk.** We expect profit margins to continue fluctuating with economic and commodity cycles. Generally, operating margins are under moderate competitive pressure from the following factors:
- The fragmented nature of the industry, given that the markets for metals and bulk commodities are global;
  - Competition is based largely on price, as the industry produces pure commodities; even the strongest mining companies cannot differentiate their products to get better or more stable pricing;
  - A high degree of operating risk from hazards such as explosions, fires, weather disruptions (including floods), and other natural disasters. This risk is, however, generally lower than that in the oil & gas industry, for example; and
  - Regulation and high taxation in many countries that may include export duties, royalties, "super-profit" taxes, license payments, and environmental obligations.
18. Nonetheless, factors that support profit margins are:
- High profitability over the cycle for most companies. This is because of the significant gap between the cash cost levels of the marginal (fourth quartile) players, which typically serves as a floor for prices, and of the established players with efficient operations;
  - The fragmented nature of customers and suppliers to the industry, which are often even more fragmented than mining companies; and

- Slow technological change in the industry, which limits costs for research and development. Exploration and evaluation costs are also moderate for established players.
19. **Risk of secular change and substitution by products, services, and technologies: Low risk.** Even though a particular metal may from time to time be substituted in some applications by other metal or plastics, etc., the scope of such substitution has been limited, the change has been gradual, and the emergence of new applications for the metal has largely compensated for it.
  20. **Risk in growth trends: Low risk.** Mining is an established industry in which midterm sales are growing at a rate similar to nominal GDP growth. The growth in demand for metals is below GDP growth for developed markets and higher than GDP growth for emerging markets. Also, sales decline heavily during a recession but then outpace GDP during the expansion phase.

### Country risk

21. Country risk plays a critical role in determining all ratings on companies in a given country. Country-related risk factors can have a substantial effect on company creditworthiness, directly and indirectly. In assessing country risk for a mining company, we use the same methodology that we use for other corporate issuers (see "Corporate Methodology"). A key factor in our business risk analysis for corporate issuers is the country risk assessment, which includes the broad range of economic, institutional, financial market, and legal risks that arise from doing business in a specific country.
22. We recognize, however, that companies in the mining industry are often exposed to particular country risk factors that may not be relevant for other industries. We consider these industry-specific country risk factors when assessing a company's competitive position.
23. To measure country risk exposure for a geographically diversified company, we generally look at the EBITDA breakdown by the countries where fixed assets are based. If information on EBITDA is not available, we may also look at operating profit, EBIT, pre-tax profit, or fixed assets. When taxation is different across countries, we focus on after-tax measures such as net profit or funds from operations (FFO), if the information is available. We also focus on where assets are located, despite the fact that revenues are often derived from diverse export markets, which partly mitigates the country risk. Only in rare cases when fixed assets are based in a low-risk country but export sales are made to a high-risk country and cannot be easily redirected elsewhere would we measure risk exposure to the high-risk country by determining the share of EBITDA or revenue from that country.

### Competitive position (including profitability)

24. Under our general corporate criteria, we assess a company's competitive position as (1) "excellent," (2) "strong," (3) "satisfactory," (4) "fair," (5) "weak," or (6) "vulnerable." In assessing the competitive position for mining issuers, we review the following components:
  - Competitive advantage;
  - Scale, scope, and diversity;
  - Operating efficiency; and
  - Profitability.
25. We assess each of the first three components as (1) "strong," (2) "strong/adequate," (3) "adequate," (4) "adequate/weak," or (5) "weak." We assess profitability separately by analyzing two subcomponents: the level of

profitability, and the volatility of profitability.

26. After evaluating the first three components, we determine the preliminary competitive position assessment by ascribing a specific weight to each component. The applicable weightings will depend on the company's Competitive Position Group Profile (CPGP).
27. The CPGP assigned to the bulk of mining issuers we rate is "Commodity Focus/Cost Driven," whereby we weight the first three components of the competitive position as follows: competitive advantage (15%); scale, scope, and diversity (35%); and operating efficiency (50%). This assessment reflects the fact that we see mining companies that have a low cost position as most able to resist steep cyclical price drops, metals and bulk commodities have standard specifications, competition is based almost exclusively on price, and even the strongest mining companies cannot differentiate their products to get better or more stable pricing. Companies that produce metal with lower/higher impurities or ore with a higher/lower concentration of the material usually get a standard formula-based premium/discount, but the price still moves in line with the overall market.
28. However, concentration risk becomes an overriding credit factor for companies that depend on a very small asset base, such as a single mine or a cluster of mines in a single region. These companies would be assigned the "Commodity Focus/Scale Driven" CPGP. The component weighting for these companies is as follows: competitive advantage (10%); scale, scope, and diversity (55%); and operating efficiency (35%). That said, if a company has a concentrated asset base but represents a large-scale, well-established mining operation with a long reserve life, we would use the "Commodity Focus/Cost Driven" approach.
29. **Competitive advantage.** In assessing a mining company's competitive advantage, we consider the following:
  - The ability to increase production and reserves through internal development;
  - Growth potential and strategy; and
  - Various other factors such as ease of access to market, contract profile, and pricing power, if those are relevant.
30. In assessing a company's ability to increase production and reserves through internal development, we consider:
  - The company's pipeline of projects over an extended period. To support a competitive advantage assessment of "adequate" or better, we would typically expect the company to have a robust pipeline over the next five to 10 years;
  - Technical resources and capabilities;
  - A track record in bringing projects into production, including the history of delays and cost overruns; and
  - A share of reserves adjacent to currently producing deposits that may be developed as a brownfield project, taking advantage of the existing infrastructure and workforce. This is less risky and expensive than greenfield development.
31. The absence of growth or declining production indicates poor prospects for meeting medium- to long-term debt-service requirements. In addition, we would have a negative view of an aggressive growth strategy that implies one or more projects are bigger than the company's existing operations, as such a strategy would stretch management resources, entail high execution risks, and place strains on funding sources. This may be exacerbated by a focus on greenfield projects and a limited track record of managing development of projects of comparable size or technology, or projects in a high-risk jurisdiction.

32. In assessing ease of access to market, contract profile, and pricing power, if relevant, we consider:
- The degree of access to markets and the existence, or lack thereof, of captive infrastructure, such as railroads or ports, that allows delivery to various regional markets and gives an advantage over land-locked peers. This is especially relevant for bulk commodity producers;
  - The existence, or lack thereof, of long-term contracts and preferred-supplier locations, notably in markets such as energy coal and uranium, and especially in times of oversupply; and
  - The extent of pricing power because of industry concentration, usually typical only for small niche industries in the sector, such as wollastonite, for example.
33. A mining company with a "strong" or "strong/adequate" competitive advantage assessment typically is characterized by a combination of the following factors:
- Good growth potential demonstrated by availability of projects and a strong track record;
  - No dependence on the success of one project;
  - A moderate or conservative growth strategy that does not stretch management's resources and funding; and
  - An advantage over its peers in ease of access to market, contract profile, or pricing power, if applicable.
34. A mining company with a "weak" or "adequate/weak" competitive advantage assessment typically is characterized by a combination of the following factors:
- Limited growth potential or a risk of declining production;
  - Dependence on the success of one big project;
  - An aggressive growth strategy; and
  - A disadvantage over its peers in ease of access to market, contract profile, or pricing power, if applicable (for instance, a land-locked position or lack of long-term contracts, if those are important for the company's industry segment).
35. **Scale, scope, and diversity.** In assessing the scale, scope, and diversity of a mining company, we consider:
- Asset diversity (the number and size of operations);
  - Reserve life of the assets;
  - Diversity of operations by commodity produced; and
  - Geographic diversity of operations and mining-specific jurisdiction risk exposure.
36. In assessing asset diversity, we evaluate the number of assets and a company's dependence on one particular asset to generate cash flow. A greater number of operating assets enhances credit quality by reducing the exposure to disruptions from unforeseen operating or geological events: floods, explosions, or labor unrest, for example. Operating diversity is more important in high-risk operations, notably underground mines.
37. We assess reserve life separately for the key commodities a company produces and for the key assets. We generally measure it by dividing proved ore reserves by the expected production volumes (based on current rates or future production rates, if the company expects significant increased production in the next few years). To differentiate between weaker, short-life proved reserves, we may consider probable reserve life and availability of resources.
38. In assessing product diversity, we evaluate the number of commodities produced; meaningful product diversity reduces exposure to commodity cycles. Companies with a broad range of metals and minerals serving different

end-use markets with different economic cycles have less volatile cash flows than producers with more concentrated profiles. We also look at each commodity's EBITDA contribution. A company with meaningful EBITDA contribution from three or four different commodities could be viewed as well-diversified.

39. In assessing geographic diversity and mining-specific jurisdiction risk exposure, we evaluate a company's exposure to particular country or jurisdiction risk factors that are relevant to mining but not to other industries, and to the extent that the factors are not sufficiently captured in the general country risk score, in our view. These factors may include:
- Environmental protection pressures (e.g., coal mining in the U.S.);
  - Inferior infrastructure that is critical for mining, such as railroads and ports;
  - Labor relations, unionization, likelihood of strikes, and labor-related cost inflation particular to the mining industry (e.g., the platinum industry in South Africa);
  - Mining-specific environmental regulations, taxes, and export regulations; and
  - Government policies that ensure predictability of future taxation and regulations (taxation is captured in our operating efficiency and profitability assessments). A track record of frequent or unexpected policy changes is a major drawback.
40. We also take into account geographic diversification that reduces exposure to a particular government's decisions.
41. Finally, we evaluate various offsetting factors, such as ownership of the company and the extent to which it may lower the likelihood of negative changes in regulation or taxation, a track record of managing these risks, or a unique position such as reliance on captive infrastructure.
42. We would view favorably a company operating in a country with low mining-specific risks or with a very well-diversified exposure to a large number of countries with medium or high mining-specific risks, as described in paragraph 23, and we would assess its scale, scope, and diversity as "strong" or "strong/adequate." On the other hand, we would view unfavorably a company with concentration in a country with high mining-specific risks that are not fully captured in the country risk score, and we would likely give it a "weak" or a "weak/adequate" assessment.
43. A mining company with a "strong" or "strong/adequate" scale, scope, and diversity assessment typically is characterized by a combination of:
- A number of large-scale assets;
  - Long-reserve-life assets (typically with proved reserve lives of at least 10 years in major operations);
  - Meaningful product diversity; or
  - Limited or well-diversified exposure to countries with high mining-specific country risks.
44. A mining company with a "weak" or "adequate/weak" scale, scope, and diversity assessment typically is characterized by a combination of:
- Dependence on one or a small number of small to medium-size assets (for instance, dependence on output from a regional cluster of mines);
  - Short-reserve-life assets (typically with proved reserve lives of one to three years);
  - Limited product diversity; or
  - Significant exposure to a country with high mining-specific country risks.

45. We may assess a single-commodity producer from a single region as "adequate" in its scale, scope, and diversity if it meets the following characteristics:
- Large-scale production;
  - A low-risk operation with multiple operating faces in the same pit, or with several different independent production streams; and
  - Assets with a reserve life of well above 10 years.
46. **Operating efficiency.** In assessing operating efficiency for a mining company, we consider:
- Cash cost positions on the global cost curve (see paragraph 47), as influenced by the quality of its reserves, the nature of its mining operations, the quality of its infrastructure, its energy and labor cost profiles, and its currency profile; and
  - The profile of off-take contracts, where relevant.
47. A company's cash cost positions on the global cost curve (the curve that plots all mining operations for a given commodity in ascending order) is the primary consideration. We evaluate the position of each asset (when disclosed by the company) because the cost position is not merely a question of the commodity's average cost: A company with first-quartile and fourth-quartile assets may have a stronger position than a company with concentrated third-quartile assets because high-cost mines may be closed in a downturn.
48. The following factors influence the cash cost position:
- Quality of reserves, including the ore grade, strip ratio, stability across the deposit, and existence of byproducts--other metals that may be extracted, reducing the cost of mining of the main commodity. Revenue from byproducts may sometimes exceed the cost of mining the primary commodity;
  - The type of mining operation--surface or underground; open-pit mines are easier and safer to operate than an underground operation and could support a low cost position with a lower ore grade;
  - Depth and geological conditions (e.g., floods, methane leakage) for underground mines determine cost as well as the risks of work stoppages and catastrophic events;
  - Quality of mining, refining, and smelting infrastructure determines recovery percentages of the main commodity and byproducts as well as energy consumption and labor intensity;
  - Power costs, which differ depending on the country and source of power. In 2007-2012, power costs in South Africa skyrocketed, pushing the local mining operations to the high-cost part of the curve;
  - Labor costs and the flexibility to recruit or lay off workers; long-standing operations face difficulties in reducing workforce, as mine production drops if the mine is a sole employer in a remote location;
  - A mining operation with a unionized workforce could face difficulties in reducing workforce on a timely basis when the cycle turns;
  - Conversely, new projects in undeveloped mining locales face a scarcity of local skilled labor and need to attract faraway employees by offering above-average salaries;
  - Distance to end markets, as production costs ultimately need to be assessed on a CIF (cost-insurance-freight) basis; and
  - Currency exposure--local currency appreciation (depreciation) compared with U.S.-dollar-based commodity prices can have a materially negative (positive) effect on cost. Costs denominated in currencies that tend to depreciate when commodity prices are low, e.g., Australian dollar, may cushion the impact.
49. Our assessment of a company's cost position relies on unaudited data and third parties' cost-curve data, which are

inherently based on uncertain estimates. We cross-check cost position analysis with EBITDA and dollar-per-ton margins across the peer group and economic cycle.

50. For some companies, usually small ones, off-take contracts may be an important consideration in assessing operating efficiency to the extent the companies contractually fix volumes and prices for the produced commodity and the counterparty is sufficiently creditworthy.
51. A mining company with a "strong" or "strong/adequate" operating efficiency assessment typically is characterized by a combination of:
- Being in the first or second quartile of the industry cash cost curve;
  - Having high and stable ore grades; or
  - Having modern concentrating, refining, and smelting equipment.
52. A mining company with a "weak" or "adequate/weak" operating efficiency assessment typically is characterized by a combination of:
- Being in the third or fourth quartile of the industry cash cost curve;
  - Having low or unstable ore grades; or
  - Having outdated or old equipment.
53. **Profitability.** The profitability assessment can confirm or modify the preliminary competitive position score. The profitability assessment consists of two components: the level of profitability, and the volatility of profitability. The two components are combined into the final profitability assessment using a matrix (see "Corporate Methodology").
54. We assess the level of profitability on a three-point scale: "above average," "average," and "below average." We use EBITDA margin as the primary indicator based on thresholds in the table below. Because the mining sector is not homogenous, and various metals and technologies have different levels of capital intensity, we may complement the analysis of overall EBITDA margin with two supplementary measures that we assess relative to those of a company's peers:
- Absolute-dollar EBITDA per ton of primary metal produced; this is particularly relevant in a company with a high share of low-margin/low-risk refining or smelting or trading operations; and
  - Return on capital.

### Mining Company EBITDA Margins

	Below average	Average	Above average
Percentage through the cycle	< 15	15-25	> 25

55. For this assessment, we typically calculate the five-year average EBITDA margin using the past two years of historical data and three years of forecast, in accordance with our general corporate criteria. We may calculate a longer period if we believe these five years of data reflect only the trough or the peak of the commodity cycle and are, therefore, not representative. Also, we could be more demanding than the through-the-cycle reference margins shown in the table if persisting capital expenditure requirements are high and vice versa.
56. We determine the volatility of profitability on a six-point scale, from '1' (least volatile) to '6' (most volatile). In

accordance with our corporate criteria, we generally use the standard error of regression (SER), subject to having at least seven years of historical annual data, and we generally use EBITDA to calculate the SER for mining companies. We also may adjust the SER assessment derived from historical data by up to two categories worse (more volatile) or better (less volatile), in accordance with our criteria. If we do not have sufficient historical information to calculate the SER, we follow the general corporate criteria guidelines to assess the volatility of profitability.

57. Even when using historical data, we frequently expect to adjust the assessment by one or two grades (for instance, because of a weighted country risk exposure of '4' or higher, the company's relative small size compared with the industry average, rapid growth in production volumes in the past, expected change in the volatility pattern of a specific commodity, or specific technology exposure--for instance, for start-up mines--as considered under the global corporate criteria). Therefore, we expect only a few companies to be assigned a volatility of profitability assessment of '1' or '2'; most mining companies would be assigned a '3' or '4'. Similarly, for smaller, less diversified companies, an assessment of '5' or '6' may be warranted, even if the SER is indicative of a profitability assessment that is two grades less volatile.

## Part II--Financial Risk Analysis

### Accounting and analytical adjustments

58. In assessing the accounting characteristics of mining companies, we use the same methodology that we use for other corporate issuers (see "Corporate Methodology"). Our analysis of a company's financial statements begins with determining whether the statements accurately measure the company's performance and position relative to those of its peers and the universe of corporate entities. To allow for globally consistent and comparable financial analyses, we may include quantitative adjustments to a company's reported results. These adjustments also enable better alignment of a company's reported figures with our view of underlying economic conditions and allow for a more accurate portrayal of a company's ongoing business. Adjustments that pertain broadly to all corporate sectors, including mining, are discussed in "Corporate Methodology: Ratios And Adjustments," published Nov. 19, 2013. Accounting characteristics and analytical adjustments that are unique to this industry are discussed below.

### Streaming transactions

59. A streaming transaction is a feature of the mining industry and is an agreement whereby a commodity producer--for example, a base metals miner that also yields some precious metals byproduct through its mining--sells the right to a share of its future byproduct production at a preset price in exchange for an upfront payment, which becomes a liability of the commodity producer. The upfront payment is recognized as a trade liability because it is related to a future sale, and it often ranks *pari passu* with other unsecured debt of the operating mine (in some cases, the liability may also benefit from guarantees). The use of funds is, on occasion, restricted to funding the construction or expansion of the mine from which the byproduct will be delivered, and in some instances, the agreement may be subject to completion tests.
60. Such agreements are typically long-dated--in some cases, covering the life of production--and the buyer has the rights to a portion of the output until the agreement terminates. The transaction provides the commodity producer with upfront financing and repayment flexibility because there are no fixed volume-delivery obligations. The streaming agreement also typically allows the commodity producer to retain ownership and control of the producing unit, and

secured interests are limited to the agreed upon share of byproduct reserves and production.

61. We view these transactions as a form of financing, and, therefore, we adjust our debt and related credit measures if the transactions have some combination of the following features:
  - If they are done in lieu of borrowing;
  - If they are repayable in cash in the event they are not satisfied by the delivery of the product;
  - If the counterparty has recourse to the issuer or a guarantor in the case of insolvency;
  - If repayment can be accelerated upon an event of default; or
  - If there is high overcollateralization or security to production coverage or some other mechanism that provides greater certainty of repayment.
62. We nevertheless recognize the lower default risk of streaming transactions, given the absence of fixed volume-delivery obligations, as well as significant financial flexibility the transactions can provide to low-rated or start-up mining companies.
63. For financial reporting purposes, issuers generally determine the amortization of the obligation to revenue using a units-of-production method. At inception, the company determines a per-unit amortization amount based on the upfront prepayment amount divided by the total units it expects to deliver to the counterparty over the life of the contract. The price per unit delivered varies over time based on changes in the ultimate expected output. As such, revenue, EBITDA, and FFO will include the noncash amortization, whereas cash flow from operations will not.
64. These contracts usually do not contain a stated interest rate, and we have found that accounting practices differ among companies, whereby some impute interest on these transactions in their financial statements, and others do not. Imputation of interest affects the amount of revenue and interest expense recognized.
65. If an issuer is imputing interest on these transactions at a reasonable rate, we do not adjust the reported revenue (and related EBITDA and FFO) and interest expense, so we simply add the reported unamortized obligation to adjusted debt. For an issuer that does not impute interest, we maintain an amortization schedule and make additional adjustments as detailed below.
66. The data necessary to make the adjustments are:
  - The original upfront payment amount;
  - The interest rate provided by the issuer or computed based on the expected timing, volume, and price of delivery. Alternatively, we may use an estimate of this rate based on the issuer's average cost of debt;
  - The amount of amortization during the period; and
  - An estimate of the incremental amortization rate, if interest had been imputed based on the percentage difference between the total undiscounted value of the product expected to be delivered and the amount of the upfront payment received.
67. We then make the following adjustments:
  - We add to debt the unamortized obligation as adjusted for imputed interest if needed;
  - We add to EBITDA the incremental revenue that would have been recognized if interest had been imputed at the implicit rate, calculated as the amortization during the period times the incremental amortization rate;

- We add to interest expense the interest imputed on the adjusted obligation on a compound basis;
- We add to FFO the equivalent adjustment we made to EBITDA and subtract the equivalent adjustment we made to interest expense; and
- In the period of receipt of the upfront payment, we subtract the upfront payment from cash flow from operations. No adjustments are made in subsequent periods.

### **Cash flow/leverage analysis**

68. In assessing the cash flow adequacy of a mining company, we use the same methodology that we use for other corporate issuers (see "Corporate Methodology"). We assess cash flow/leverage on a six-point scale, ranging from '1' (minimal) to '6' (highly leveraged), by aggregating the assessments of a range of credit ratios, predominantly cash flow-based, that complement each other by focusing on the different levels of a company's cash flow in relation to its obligations.

### **Core ratios**

69. For each company, we calculate two core debt payback ratios, FFO to debt and debt to EBITDA, in accordance with our ratios and adjustment criteria (see "Corporate Methodology: Ratios And Adjustments").

### **Supplemental ratios**

70. We also consider supplemental ratios to develop a fuller understanding of a company's credit risk profile and to refine our cash flow analysis in accordance with our global corporate criteria.
71. Given the high capital intensity of the industry, we generally consider free operating cash flow (FOCF) to debt, if the core ratios are "intermediate" or better, as defined in our criteria.
72. When the cash flow/leverage assessment indicated by the core ratios is "significant" or weaker, we consider:
- FFO plus cash interest divided by cash interest;
  - EBITDA to interest; and
  - FOCF to debt if a company with limited debt embarks on an ambitious capital expenditure program that would be difficult to curtail significantly in case of an economic downturn.
73. Working capital funding fluctuations and cash flow from operations to debt are of limited importance in the mining industry because margins are high and the cash conversion cycle is short, and because working capital outlays usually coincide with a strong industry environment and high FFO, and vice versa.

### **Time horizon**

74. In accordance with our global corporate criteria, we emphasize credit ratios based on our forward-looking view of market conditions, which may differ materially from historical ratios. Generally, we calculate the indicative ratios by weighting data from the previous two years, the current year, and the forecasted two years as 10%, 15%, 25%, 25%, and 25%. In certain circumstances, our corporate criteria provides for the application of different weightings, for instance when we forecast that cash available for debt repayment will be negative and we expect credit measures to deteriorate.

### **Volatility adjustment**

75. Given the significant cyclicality in the mining industry, we expect to classify most mining companies' cash flow/leverage assessments as "volatile" or "highly volatile," meaning we expect their cash flow/leverage ratios to

move, respectively, one or two categories worse, or two to three categories worse during a market downturn. In determining whether and by how much to modify our assessment because of expected volatility, we follow the global corporate criteria.

## Part III--Rating Modifiers

### Diversification/Portfolio effect

76. In assessing a mining company's diversification/portfolio effect, we use the same methodology that we use for other corporate issuers (see "Corporate Methodology"), i.e., reserving potential diversification benefit only to companies whose portfolios span different industries, as defined by our industry classification. Many mining issuers are well-diversified by product and report several large business segments. Yet those businesses usually remain mining businesses in nature and therefore receive no diversification/portfolio effect benefit. We treat mining companies that are integrated with downstream steel or aluminum operations as vertically integrated producers and are covered under "Key Credit Factors For The Metals And Mining Downstream Industry," published Dec. 20, 2013.

### Capital structure

77. In assessing a mining company's capital structure, we use the same methodology that we use with other corporate issuers (see "Corporate Methodology").

### Liquidity

78. In assessing a mining company's liquidity, we use the same methodology that we use with other corporate issuers (see "Corporate Methodology").

### Financial policy

79. In assessing a mining company's financial policy, we use the same methodology that we use with other corporate issuers (see "Corporate Methodology").

### Management and governance

80. In assessing a mining company's management and governance, we use the same methodology that we use with other corporate issuers (see "Corporate Methodology").

### Comparable ratings analysis

81. In assessing a mining company's comparable ratings analysis, we use the same methodology that we use with other corporate issuers (see "Corporate Methodology").

## RELATED CRITERIA AND RESEARCH

- Key Credit Factors For The Metals And Mining Downstream Industry, Dec. 20, 2013
- Corporate Methodology, Nov. 19, 2013
- Methodology: Industry Risk, Nov. 19, 2013
- Corporate Methodology: Ratios And Adjustments, Nov. 19, 2013
- Methodology And Assumptions: Liquidity Descriptors For Global Corporate Issuers, Nov. 19, 2013
- Country Risk Assessment Methodology And Assumptions, Nov. 19, 2013

- Methodology For Standard & Poor's Metals And Mining Price Assumptions, Nov. 19, 2013
- Methodology: Management And Governance Credit Factors For Corporate Entities And Insurers, Nov. 13, 2012
- Principles of Credit Ratings, Feb. 16, 2011

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