MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY
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Rating Methodology

Steel

This rating methodology replaces the *Steel Industry* methodology published in September 2017. We have reordered and have made editorial updates to various sections of the methodology, and we have changed the presentation of the scorecard. These updates do not change our methodological approach.

Scope

This methodology applies to companies globally that are primarily* engaged in the production and sale of carbon, stainless and specialty steel on a semi-finished or value-added basis, including integrated steel producers and mini-mills.

This methodology also applies to producers of downstream fabricated aluminum products or other metal-based products whose revenues and earnings are derived from a margin-on-metal construct.[1]

Companies that have activities in the above-mentioned areas but that are primarily engaged in the extraction or mining of ore, coal or other minerals are rated under our methodology for mining companies.[2]

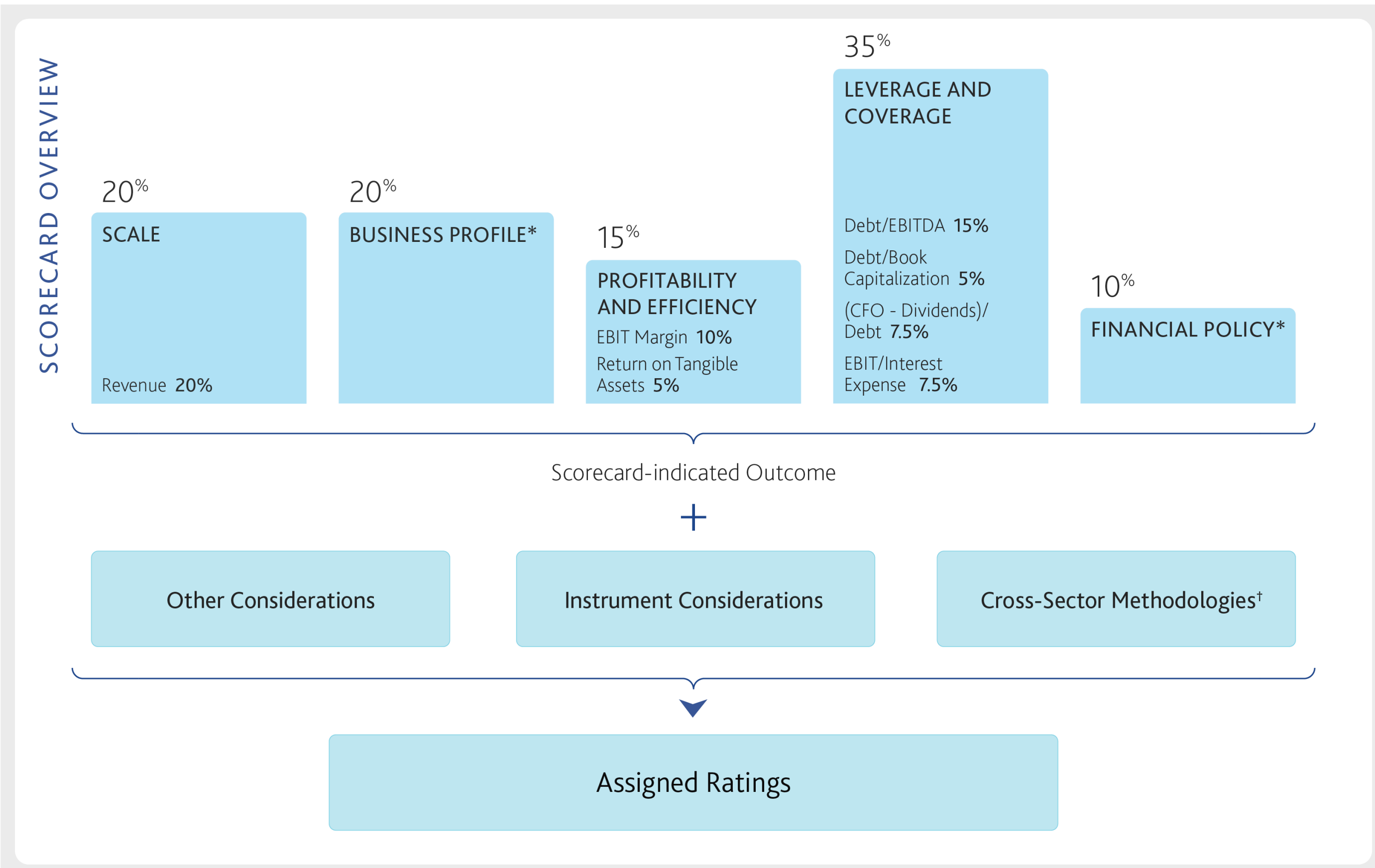
*The determination of a company's primary business is generally based on the preponderance of the company's business risks, which are usually proportionate to the company's revenues, earnings and cash flows.

Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of producers of steel and downstream fabricated aluminum products or other metal-based products globally, including the qualitative and quantitative factors that are likely to affect rating outcomes in this sector. We seek to incorporate all material credit considerations in ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

The following schematic illustrates our general framework for the analysis of these companies, which includes the use of a scorecard.[3] The scorecard-indicated outcome is not expected to match the actual rating for each company. For more information, see the "Other considerations" and "Limitations" sections.

Exhibit 1
Illustration of the steel methodology framework



* This factor has no sub-factors.
† Some of the methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.
Source: Moody's Investors Service

Steel scorecard

For general information about how we use the scorecard and for a discussion of scorecard mechanics, please see the "Using the scorecard to arrive at a scorecard-indicated outcome" section. The scorecard does not include or address every factor that a rating committee may consider in assigning ratings in this sector. Please see the "Other considerations" and "Limitations" sections.

Exhibit 2

Steel scorecard

	SCALE (20%)	BUSINESS PROFILE (20%)	PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (35%)				FINANCIAL POLICY (10%)
	Revenue (USD Billion)[1] (20%)	Business Profile (20%)	EBIT Margin (EBIT / Revenue)[2] (10%)	Return on Tangible Assets (EBIT / Tangible Assets)[3] (5%)	Debt / EBITDA[4] (15%)	Debt / Book Capitaliz-ation[5] (5%)	(CFO - Dividends) / Debt[6] (7.5%)	EBIT / Interest Expense[7] (7.5%)	Financial Policy (10%)
Aaa	≥ $70	Essentially no earnings volatility is expected; commanding market position with well-balanced global exposure and no vulnerability to imports or cyclicality; a very high percentage of value-added products across extremely diverse end-markets; entrenched ability to control costs with technological advantages; and geopolitical environment poses no risk of impact on commercial activities.	≥ 30%	≥ 20%	≤ 0.5x	≤ 20%	≥ 65%	≥ 18x	Expected to have extremely conservative financial policies (including risk and liquidity management); very stable metrics; essentially no event risk that would cause a rating transition; and public commitment to a very strong credit profile over the long term.
Aa	$40 - $70	Very low earnings volatility is expected; deeply entrenched and leading market position with global exposure and highly defensible position against imports and cyclicality due to cost-effectiveness and technological competencies; a high percentage of value-added products across highly diverse end-markets; and geopolitical environment poses very low risk of impact on commercial activities.	20% - 30%	15% - 20%	0.5x - 1x	20% - 30%	50% - 65%	12x - 18.0x	Expected to have very conservative financial policies (including risk and liquidity management); stable metrics; minimal event risk that would cause a rating transition; and public commitment to a strong credit profile over the long term.
A	$20 - $40	Low earnings volatility is expected; strong market position in its relevant markets with a high percentage of value-added products; demonstrated and sustainable competitive advantages with modest vulnerability to imports and insulation from fluctuations in raw material costs; very broad diversity in products, end-markets and geographies; and geopolitical environment poses low risk of impact on commercial activities.	13% - 20%	10% - 15%	1x - 2x	30% - 40%	40% - 50%	7x - 12x	Expected to have predictable financial policies (including risk and liquidity management) that preserve creditor interests; although modest event risk exists, the effect on leverage is likely to be small and temporary; strong commitment to a solid credit profile.

	SCALE (20%)	BUSINESS PROFILE (20%)	PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (35%)				FINANCIAL POLICY (10%)
	Revenue (USD Billion)[1] (20%)	**Business Profile (20%)**	**EBIT Margin (EBIT / Revenue)[2] (10%)**	**Return on Tangible Assets (EBIT / Tangible Assets)[3] (5%)**	**Debt / EBITDA[4] (15%)**	**Debt / Book Capitaliz-ation[5] (5%)**	**(CFO - Dividends) / Debt[6] (7.5%)**	**EBIT / Interest Expense[7] (7.5%)**	**Financial Policy (10%)**
Baa	$10 - $20	Moderate earnings volatility is expected; solid market position in its most important geographic or product markets; good mix of value-added and commodity products, helping to mitigate vulnerability to imports; a competitive cost position or can pass through the majority of its costs; good diversity in products, end-markets and geographies provides a buffer against sudden, unexpected shifts in demand; and geopolitical environment poses modest but manageable risk of impact on commercial activities.	8% - 13%	7% - 10%	2x - 3x	40% - 50%	30% - 40%	4x - 7x	Expected to have financial policies (including risk and liquidity management) that balance the interests of creditors and shareholders; some risk that debt-funded acquisitions or shareholder distributions could lead to a weaker credit profile.
Ba	$4 - $10	Somewhat elevated earnings volatility is expected; products are largely undifferentiated or more commodity-based, or the marketplace is highly competitive, exposing the company to periods of heightened volatility and to a greater vulnerability to imports; however; this exposure is tempered by an established market position or by a favorable cost position or by an ability to pass through raw material costs or by fair diversity characteristics but still modest concentration in products, end-markets or geographies; or geopolitical environment poses moderate risk of impact on commercial activities.	5% - 8%	4% - 7%	3x - 4x	50% - 70%	15% - 30%	2.5x - 4x	Expected to have financial policies (including risk and liquidity management) that tend to favor shareholders over creditors; above-average financial risk resulting from shareholder distributions, acquisitions, or other significant capital structure changes.
B	$1.75 - $4	Substantial earnings volatility is expected; products are undifferentiated, or commodity products form a significant percentage of output; or competition is intense and customers are price-sensitive, making results highly volatile; or highly vulnerable to imports or no advantageous cost profile; or limited technological capabilities or other mitigating competitive advantage; or high operational concentration; or geopolitical environment poses high risk of impact on commercial activities.	2% - 5%	2% - 4%	4x - 5.5x	70% - 80%	10% - 15%	1.5x - 2.5x	Expected to have financial policies (including risk and liquidity management) that favor shareholders over creditors; high financial risk resulting from shareholder distributions, acquisitions, or other significant capital structure changes.

	SCALE (20%)	BUSINESS PROFILE (20%)	PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (35%)				FINANCIAL POLICY (10%)
	Revenue (USD Billion)[1] (20%)	**Business Profile (20%)**	**EBIT Margin (EBIT / Revenue)[2] (10%)**	**Return on Tangible Assets (EBIT / Tangible Assets)[3] (5%)**	**Debt / EBITDA[4] (15%)**	**Debt / Book Capitalization[5] (5%)**	**(CFO - Dividends) / Debt[6] (7.5%)**	**EBIT / Interest Expense[7] (7.5%)**	**Financial Policy (10%)**
Caa	$1 - $1.75	Extremely volatile earnings are expected; modest market presence or mostly produces commodity products; or has few competitive advantages; or has above-average costs or limited technological capabilities; or very high operational concentration (1 or 2 locations); or geopolitical environment poses very high risk of impact on commercial activities.	0% - 2%	0% - 2%	5.5x - 7.5x	80% - 90%	5% - 10%	1x - 1.5x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	$0.5 - $1	Near-term earnings are difficult to predict with any degree of confidence; no material competitive advantage; or extremely high operational concentration; or geopolitical environment poses extremely high risk of impact on commercial activities.	0% - -5%	0% - -5%	7.5x - 9x	90% - 110%	0% - 5%	0x - 1x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.
C	< $0.5	Near-term earnings are expected to be extremely negative with no expectation of recovery; no material competitive or cost advantage.	< -5%	< -5%	> 9x	> 110%	< 0%	< 0x	Expected to have financial policies (including risk and liquidity management) that create imminent risk of debt restructuring.

[1] For the linear scoring scale, the Aaa endpoint value is $100 billion. A value of $100 billion or better equates to a numeric score of 0.5. The C endpoint value is zero. A value of zero or worse equates to a numeric score of 21.5.
[2] For the linear scoring scale, the Aaa endpoint value is 60%. A value of 60% or better equates to a numeric score of 0.5. The C endpoint value is -15%. A value of -15% or worse equates to a numeric score of 21.5.
[3] For the linear scoring scale, the Aaa endpoint value is 50%. A value of 50% or better equates to a numeric score of 0.5. The C endpoint value is -15%. A value of -15% or worse equates to a numeric score of 21.5.
[4] For the linear scoring scale, the Aaa endpoint value is 0x. A value of 0x equates to a numeric score of 0.5. The C endpoint value is 13x. A value of 13x or worse equates to a numeric score of 21.5, as does a negative Debt/EBITDA value.
[5] For the linear scoring scale, the Aaa endpoint value is 0%. A value of 0% equates to a numeric score of 0.5. The C endpoint value is 140%. A value of 140% or worse equates to a numeric score of 21.5, as does a negative Debt/Book Capitalization value.
[6] For the linear scoring scale, the Aaa endpoint value is 85%. A value of 85% or better equates to a numeric score of 0.5. The C endpoint value is -5%. A value of -5% or worse equates to a numeric score of 21.5.
[7] For the linear scoring scale, the Aaa endpoint value is 25x. A value of 25x or better equates to a numeric score of 0.5. The C endpoint value is -1x. A value of -1x or worse equates to a numeric score of 21.5.
Source: Moody's Investors Service

Sector overview

The steel industry is mature, cyclical and exhibits a high degree of earnings volatility. Industry fundamentals are influenced by general global economic conditions and are sensitive to the performance of industries that use steel, such as the automotive, construction, energy and durable-equipment industries, among others.

Steel prices are volatile, reflecting the limited pricing power of producers of the commodity-like metal as well as supply-demand imbalances. Pervasive global overcapacity and disparities between local and international steel prices can lead to increased trading activity that exacerbates this volatility. Because of these imbalances, the steel industry has become the focus of significant political and regulatory scrutiny across jurisdictions with substantial production capacity. This scrutiny can take the form of trade cases or protective domestic policies against steel imports.

Raw material costs also can be volatile, especially the cost of scrap metal, iron ore and coking coal, and disconnects between movements in steel prices and input costs can squeeze margins. The steel industry typically has significant operating leverage, particularly among integrated producers. The ability to run plants at optimal utilization levels is critical to absorbing fixed costs and to achieving or maintaining cost-competitiveness despite the price volatility at both the input and output ends of the business.

Additionally, the industry remains vulnerable to substitution risk in key markets such as the automotive industry, where it has experienced increasing penetration by aluminum to lightweight vehicles. As such, a steel company's ability to introduce technologically advanced products, like high strength steel, is generally critical to its long-term viability.

Although most of these challenges are common among steel producers, business characteristics may vary significantly. The type of steel a company produces, its end-markets, its scale and cost-competitiveness, its technological capabilities and the strength of its customer relationships are key differentiating factors among companies and can drive resilience to industry risks.

Discussion of the scorecard factors

In this section, we explain our general approach for scoring each scorecard factor or sub-factor, and we describe why they are meaningful as credit indicators.

Factor: Scale (20% weight)

Why it matters

Scale, which is an indicator of the revenue-generating capability of a company, is important because it provides key indications of a steel producer's overall market strength, its importance to the markets it serves and its staying power.

Given the cyclicality of the steel industry and the volatility of global steel prices, companies with larger scale generally have greater flexibility to manage their businesses through different price and demand scenarios. A large revenue base also leads to important economies of scale that lower overall costs for raw materials and corporate functions, such as finance, legal, tax and accounting costs. Larger companies also tend to generate higher cash flow for capital reinvestment and debt reduction. They also have greater access to the capital markets, which can reduce the cost of capital.

How we assess it for the scorecard

REVENUE:

We use revenue expressed in billions of US dollars.

Factor: Business Profile (20% weight)

Why it matters

The business profile of a steel company is important because it greatly influences its ability to generate earnings and operating cash flows and the stability and sustainability of those flows. Core aspects of a steel company's business profile include its market position, cost-competitiveness, product mix and diversity of end-markets as well as its susceptibility to geopolitical events, all of which drive resilience to volatility.

A steel company's market position is important because it influences its susceptibility to volatility and its long-term sustainability. Product quality, manufacturing expertise, technical know-how and customer service have a large degree of influence on a company's market position because they help build defensible customer relationships, strengthen pricing power or lock in long-term delivery contracts.

Steel producers typically have little ability to differentiate their products and mainly compete on the basis of price, over which they exert little control, therefore making low costs one of their most significant competitive advantages. With raw material costs representing a large part of total costs (often between 60% and 80%), a company's ability to control its costs is critical.

A diverse mix of production locations, products, end-markets and geographies is important because it reduces a company's exposure to one product or developments in one economy that could cause earnings to erode. Having operations in multiple locations lessens the impact of strikes, equipment failures, power outages and other operational event risks that could significantly curtail output. Production concentration at one or a few mill sites creates elevated operational risk and gives a company fewer options to optimize production. Steel and fabricated aluminum producers with broad customer bases in the automotive, construction, home appliance and manufacturing industries are often able to better cope with demand weakness in a particular customer industry. In addition, geographic diversity helps steel and downstream aluminum companies mitigate the impact of trade barriers and tariffs on their exports.

Because the trading of steel products and the raw materials used for steel production is global, geopolitical events in countries that are major producers of steel, iron ore and metallurgical coal is another important consideration because such events could have a profound impact on the business of steel companies around the globe. For example, suspended production of iron ore or coal in one region could disrupt the supply chain of steel companies in another region. A government that seeks to reduce overcapacity or step up environmental requirements could constrain local production to the benefit of foreign producers. Conversely, import restrictions, tariffs and anti-dumping provisions typically benefit local producers at the expense of producers selling into that country and may have spillover effects to other markets.

How we assess it for the scorecard

Scoring for this factor is primarily based on our expectations for earnings volatility based on several qualitative assessments. We consider the company's market position and ability to offer value-added products or differentiated services to its customers; its ability to manage fluctuations in raw material costs and to pass through cost inflation to customers; its diversity in terms of operations, product offerings, end-markets and geographies; and the impact of geopolitical risk on its business activities.

Our assessment of a company's market position is typically based on its share of the market for its major products, its pricing power and its ability to secure long-term contracts with customers by offering value-added products or differentiated services. We also may consider potential changes in its competitive landscape as a result of market consolidation, new entrants and technological progress.

In assessing a company's ability to control costs, we typically consider the extent to which a company's raw material procurement policy and inventory management, as well as its bargaining positions with major suppliers, insulate it from the effects of raw material price movements. Backward integration in raw materials, whereby a steelmaker merges with or acquires a former supplier, may be another consideration because it can lead to greater cost control and often translates into higher profitability compared with peers.

The protection may be enhanced by contractual agreements that enable a steel company to pass through certain costs to customers. This feature has been more common in mature economies, such as the US and Japan, and in certain product markets, such as automotive, and stainless steel and specialty alloys. The markets for iron ore and coking coal generally function either on a contract basis or on a spot, monthly or quarterly price basis in the seaborne markets. Depending on where prices are at any point in time, steel companies that operate on a shorter-term basis can be exposed to volatility in costs, while companies that operate on a contract basis can ultimately end up with prices that are above or below the market.

We may also consider a company's ability to reduce its operating leverage, which is typically high in the steel and downstream aluminum industries. This may also support flexibility and ability to respond to temporary reductions in demand for steel or aluminum products. Additionally, producers that are able to reduce their energy consumption are also more cost-competitive and able to lower their carbon intensity.

In assessing a company's business profile, we generally consider several dimensions of diversity. We may consider concentration risk in terms of production locations and end-markets as well as product types and customer segments. Companies with a balanced contribution from a number of production locations, products or end-markets typically score higher for this factor because of the protection diversity affords against the risk of disruption in a specific market. Limited operational diversity can constrain scoring for this factor, particularly if the company relies heavily on one or two operating locations.

Our assessment of geographic diversity typically takes into consideration the breadth of a company's operations and sales internationally. However, broad diversification by itself would likely not be viewed as an advantage if the company does not also have meaningful business scale, product leadership or cost advantages in the areas in which it operates.

In assessing a company's exposure to geopolitical risk, we typically consider risks that emanate from regulation (including changing regulation), government actions and major events in any jurisdiction that could negatively affect the commercial activities of steel or downstream aluminum companies in that jurisdiction or in other jurisdictions. Such risks include tightening environmental regulations, policies to reduce excess steel capacity, suspended mining activities, import or export restrictions and tariffs, and anti-dumping provisions.

In addition, we typically consider the impact of local or international military conflicts on a steel producer. We may assess the materiality of geopolitical risks in light of the likelihood of a particular event and the extent of its impact on the issuer.

Generally, we do not expect a given company's business profile to exactly match the attributes listed for a given scoring category. We typically assign the factor score based on the alpha category for which the company has the greatest number of characteristics. However, there may be cases in which one characteristic is sufficiently important to a particular company's credit profile that it has a large influence on the factor score. For example, a reliance on a small number of operating locations is likely to limit the score to the B or Caa rating category, because operating risk in these cases is typically very high. Companies whose output and profitability depend on one or only a few mill sites are more likely to be impacted by strikes, equipment failure, power outages and other operating problems. Such companies are also more likely to have limited product and end-market diversity, thereby negatively affecting their earnings stability.

Factor: Profitability and Efficiency (15% weight)

Why it matters

Profits matter because they are needed to generate sustainable cash flow and maintain a competitive position, which includes making sufficient reinvestments in marketing, research, facilities and the workforce. The ability to sustain high profitability is generally a strong indicator of operating efficiency and of substantial competitive advantages, particularly if combined with evidence of stable or rising market share.

This factor comprises two quantitative sub-factors:

EBIT Margin

The ratio of earnings before interest and taxes to revenue (EBIT/Revenue) provides insight into the operational profitability of a steel producer.

Return on Tangible Assets

The ratio of earnings before interest and taxes to tangible assets (EBIT/Tangible Assets) provides an indication of the efficiency of assets employed. Given the capital-intensive nature of the steel industry and the need for companies to operate at high capacity utilization rates, this ratio provides a further indication of a company's ability to generate meaningful returns from its asset base.

How we assess it for the scorecard

Scoring for this factor is based on two sub-factors: EBIT Margin; and Return on Tangible Assets.

Steel companies require continuous reinvestment in property, plant and equipment to maintain their competitiveness. For this reason, profitability measures such as EBIT that take into account depreciation expenses typically provide more meaningful insight into the sustainability of a company's performance.

EBIT MARGIN:

The numerator is EBIT, and the denominator is revenue.

RETURN ON TANGIBLE ASSETS:

The numerator is EBIT, and the denominator is tangible assets (i.e., total assets minus goodwill and other intangible assets).

Factor: Leverage and Coverage (35% weight)

Why it matters

Leverage and cash flow coverage measures provide important indications of the magnitude of financial risk a steel company is willing to undertake as well as its ability to sustain its competitive position, invest in growth opportunities and pay debt.

Steel producers are generally less tolerant of a high degree of financial leverage than companies in other industries in which cash flow generation is more stable or prices are less volatile. Steel companies that maintain lower leverage have greater operational flexibility to manage changes in competitive and economic conditions and to invest in the business, either through organic growth or acquisitions.

This factor comprises four quantitative sub-factors:

Debt / EBITDA

The ratio of total debt to earnings before interest, taxes, depreciation and amortization (Debt/EBITDA) is an indicator of debt serviceability and financial leverage. The ratio is commonly used in this sector as a proxy for comparative financial strength.

Debt / Book Capitalization

The ratio of total debt to book capitalization (Debt/Book Capitalization) is a measure of balance sheet leverage that indicates how much of a company's capital structure is composed of debt and debt-like obligations. Companies frequently use this ratio to set the range of leverage in which they choose to operate, so this ratio provides an indication of management's risk tolerance and a reference point for comparing capital structures within the industry.

(CFO – Dividends) / Debt

The ratio of cash flow from operations minus dividends to debt (CFO – Dividends/Debt) is an indicator of a company's ability to repay its debt. It is a measure or estimate of cash flow generation after working capital movements and dividends in relation to total debt.

EBIT / Interest Expense

The ratio of earnings before interest and taxes to interest expense (EBIT/Interest Expense) is an indicator of a company's ability to meet its interest obligations.

How we assess it for the scorecard

Scoring for this factor is based on four sub-factors: Debt/EBITDA; Debt/Book Capitalization; (CFO – Dividends)/Debt; and EBIT/Interest Expense.

DEBT / EBITDA:

The numerator is total debt, and the denominator is EBITDA.

DEBT / BOOK CAPITALIZATION:

The numerator is total debt, and the denominator is book capitalization.

(CFO – DIVIDENDS) / DEBT:

The numerator is cash flow from operations minus dividends, and the denominator is total debt.

EBIT / INTEREST EXPENSE:

The numerator is EBIT, and the denominator is interest expense.

Factor: Financial Policy (10% weight)

Why it matters

Management and board tolerance for financial risk is an important rating determinant, because it directly affects debt levels, credit quality, and the risk of adverse changes in financing and capital structure.

Our assessment of financial policies includes the perceived tolerance of a company's governing board and management for financial risk and the future direction for the company's capital structure. Considerations include a company's public commitments in this area, its track record for adhering to commitments and our views on the ability of the company to achieve its targets.

Financial risk tolerance serves as a guidepost to investment and capital allocation. An expectation that management will be committed to sustaining an improved credit profile is often necessary to support an upgrade. For example, we may not upgrade the ratings of a company that has built flexibility within its rating category if we believe the company will use that flexibility to fund a strategic acquisition, cash distribution to shareholders, spin-off or other leveraging transaction. Conversely, a company's credit rating may be better able to withstand a moderate leveraging event if management places a high priority on returning credit metrics to pre-transaction levels and has consistently demonstrated the commitment to do so through prior actions. Liquidity management[4] is an important aspect of overall risk management and can provide insight into risk tolerance.

How we assess it for the scorecard

We assess the issuer's desired capital structure or targeted credit profile, its history of prior actions, including its track record of risk and liquidity management, and its adherence to its commitments. Attention is paid to management's operating performance and use of cash flow through different phases of economic and industry cycles. Also of interest is the way in which management responds to key events, such as changes in the credit markets and liquidity environment, legal actions, competitive challenges or regulatory pressures.

When considering event risks in the context of scoring financial policy, we assess the likelihood and potential negative impact of M&A or other types of balance-sheet-transforming events. Management's appetite for M&A activity is assessed, with a focus on the type of transactions (i.e., core competency or new business) and funding decisions. Frequency and materiality of acquisitions and previous financing choices are evaluated. A history of debt-financed or credit-transforming acquisitions will generally result in a lower score for this factor. We may also consider negative repercussions caused by shareholders' willingness to sell the company.

We also consider a company's and its owners' past record of balancing shareholder returns and debt holders' interests. A track record of favoring shareholder returns at the expense of debt holders is likely to be viewed negatively in scoring this factor.

Other considerations

Ratings may reflect consideration of additional factors that are not in the scorecard, usually because the factor's credit importance varies widely among the issuers in the sector or because the factor may be important only under certain circumstances or for a subset of issuers. Such factors include financial controls and the quality of financial reporting; corporate legal structure; the quality and experience of management; assessments of corporate governance as well as environmental and social considerations; exposure to uncertain licensing regimes; and possible government interference in some countries. Regulatory, litigation, liquidity, technology and reputational risk as well as changes to consumer and business spending patterns, competitor strategies and macroeconomic trends also affect ratings.

Following are some examples of additional considerations that may be reflected in our ratings and that may cause ratings to be different from scorecard-indicated outcomes.

Management Strategy

The quality of management is an important factor supporting a company's credit strength. Assessing the execution of business plans over time can be helpful in assessing management's business strategies, policies and philosophies and in evaluating management performance relative to performance of competitors and our projections. Management's track record of c adhering to stated plans, commitments and guidelines provides insight into management's likely future performance, including in stressed situations.

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in this industry. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[5]

Among the areas of focus in corporate governance, for example, are audit committee financial expertise, the incentives created by executive compensation packages, related party transactions, interactions with outside auditors and ownership structure.

Regulatory Considerations

Companies in the steel sector are subject to different degrees of regulatory oversight, with regulations and compliance requirements varying globally and regionally. These requirements encompass regulations for air pollution, particularly carbon dioxide (CO2) emissions, waste-water discharges, solid and hazardous waste disposal, and site remediation, among others.

Increasing environmental requirements and efforts to reduce greenhouse gas emissions (known as carbon transition risk) may lead to higher costs and make permitting for sites more burdensome. In addition, increased electricity costs as utilities themselves make efforts to comply with more stringent emissions requirements also may contribute to higher costs for the energy-intensive steel industry. Stricter regulations may entail limitations on operations, greater potential for technology disruptions and demand substitution, and higher investment requirements to stave off competition from aluminum producers, which have been making further inroads into the automotive industry at the expense of steel producers.

Regional and global differences in CO2 emissions requirements and other regulations, as well as their implementation or enforcement, may advantage or disadvantage particular issuers. Production methods (e.g., blast furnaces, which are more exposed to carbon transition risk than electric arc furnaces) are a further differentiating factor.

Our view of future regulations plays an important role in our expectations of future financial metrics as well as our confidence level in the ability of an issuer to generate sufficient cash flows relative to its debt burden over the medium and longer term. The level and evolution of carbon transition risks and its impact on companies in the steel sector will depend on the extent of carbon restrictions and the timing of their implementation. Increased costs and higher capital investment requirements would pressure earnings and cash flow generation. The long-term nature of carbon transition risks as well as other environmental compliance requirements may mean that they are not fully reflected in our published scorecards. Forward-looking published scorecards are typically based on our near-term projections, in part because we may not have sufficient visibility into an issuer's future results beyond this time horizon that would enable us to accurately score these factors. Over time, carbon transition risks, as they become more quantifiable, could cause our ratings to be lower than scorecard-indicated outcomes for some companies in the sector.

Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor ratings in this sector. The quality of financial statements may be influenced by internal controls, including the proper tone at the top, centralized operations, and consistency in accounting policies and procedures. Auditors' reports on the effectiveness of internal controls, auditors' comments in financial reports and unusual restatements of financial statements or delays in regulatory filings may indicate weaknesses in internal controls.

Liquidity

Liquidity is an important rating consideration for all steel companies, although it may not have a substantial impact in discriminating between two issuers with a similar credit profile. Liquidity can be particularly important for companies in highly seasonal or cyclical operating environments where working capital needs must be considered, and ratings can be heavily affected by extremely weak liquidity. We form an opinion on likely near-term liquidity requirements from the perspective of both sources and uses of cash. For more details on our approach, please see our liquidity cross-sector methodology.[6]

Excess Cash Balances

Some companies in this sector may maintain cash balances (meaning liquid short-term investments as well as cash) that are far in excess of their operating needs. This excess cash can be an important credit consideration; however, the underlying policy and motivations of the issuer in holding high cash balances are often as or more important in our analysis than the level of cash held. We have observed significant variation in company behavior based on differences in financial philosophy, investment opportunities, availability of committed revolving credit facilities and shareholder pressures.

Most issuers need to retain some level of cash in their business for operational purposes. The level of cash required to run a business can vary based on the region(s) of operation and the specific sub-sectors in which the issuer operates. Some issuers have very predictable cash needs and others have much broader intra-period swings, for instance related to mark-to-market collateral requirements under hedging instruments. Some companies may hold large levels of cash at times because they operate without committed, long-term bank borrowing facilities. Some companies may hold cash on the balance sheet to meet long-term contractual liabilities, whereas other companies with the same types of liabilities have deposited cash into trust accounts that are off balance sheet. The level of cash that issuers are willing to hold can also vary over time based on the cost of borrowing and macroeconomic conditions. The same issuer may place a high value on cash holdings in a major recession or financial crisis but seek to pare cash when inflation is high. As a result, cash on the balance sheet is most often considered qualitatively, by assessing the issuer's track record and financial and liquidity policies rather than by measuring how a point-in-time cash balance would affect a specific metric.

Across all corporate sectors, an important shareholder-focused motivation for cash holdings, sometimes over very long periods, is cash for acquisitions. In these cases, we do not typically consider that netting cash against the issuer's current level of debt is analytically meaningful; however, the cash may be a material mitigant in our scenario analyses of potential acquisitions, share buybacks or special dividends. Tax minimization strategies have at times been another primary motivation for holding large cash balances. Given shareholder pressures to return excess cash holdings, when these motivations for holding excess cash are eliminated, we generally expect that a large portion of excess cash will be used for dividends and share repurchases.

By contrast, some companies maintain large cash holdings for long periods of time in excess of their operating and liquidity needs solely due to conservative financial policies, which provides a stronger indication of an enduring approach that will benefit creditors. For instance, some companies have a policy to routinely pre-fund upcoming required debt payments well in advance of the stated maturity. Such companies may also have clearly stated financial targets based on net debt metrics and a track record of maintaining their financial profile within those targets.

While the scorecard in this methodology uses leverage and coverage ratios with total (or gross) debt rather than net debt, we do consider excess cash holdings in our rating analysis, including in our assessment of the financial and liquidity policy. For issuers where we have clarity into the extent to which cash will remain on the balance sheet and/or be used for creditor-friendly purposes, excess cash may be considered in a more quantitative manner. While we consider excess cash in our credit assessment for ratings, we do not typically adjust the balance sheet debt for any specific amount because this implies greater precision than we think is appropriate for the uncertain future uses of cash. However, when cash holdings are unusually large relative to debt, we may refer to debt net of cash, or net of a portion of cash, in our credit analysis and press releases in order to provide additional insight into our qualitative assessment of the credit benefit. Alternatively, creditor-friendly use of cash may be factored into our forward view of metrics, for instance when the cash is expected to be used for debt-repayment. We may also cite rating threshold levels for certain issuers based on net debt ratios, particularly when these issuers have publicly stated financial targets based on net debt metrics.

Even when the eventual use for excess cash is likely to be for purposes that do not benefit debtholders, large holdings provide some beneficial cushion against credit deterioration, and cash balances are often considered in our analysis of near-term liquidity sources and uses. Such downside protection is usually more important for low rated companies than for highly rated companies due to differences in credit stability and the typically shorter distance from potential default for issuers at the lower end of the ratings spectrum.

Additional Metrics

The metrics included in the scorecard are those that are generally most important in assigning ratings to companies in this industry; however, we may use additional metrics to inform our analysis of specific companies. These additional metrics may be important to our forward view of metrics that are in the scorecard or other rating factors.

For example, free cash flow is not always an important differentiator of credit profiles. Strong companies with excellent investment opportunities may demonstrate multiyear periods of negative free cash flow while retaining solid access to capital and credit, because these investments will yield stable cash flows in future years. Weaker companies with limited access to credit may have positive free cash flow for a period of time because they have curtailed the investments necessary to maintain their assets and future cash-generating prospects. However, in some cases, free cash flow can be an important driver of the future liquidity profile of an issuer, which, as noted above, can have a meaningful impact on ratings.

Non-wholly Owned Subsidiaries

Some companies in the steel sector choose to dilute their equity stake in certain material subsidiaries, for example through an initial public offering, which may in some cases negatively impact future financial flexibility. While improving cash holdings on a one-off basis, selling minority interests in subsidiaries may have a negative impact on cash flows available to the parent company that may not be fully reflected in consolidated financial statements.[7] The parent's share of dividend flows from a non-wholly owned subsidiary is reduced, and minority stakes can increase structural subordination, since dividend flows to minority interest holders are made before the cash flows are available to service debt at the parent company. While less frequent, sale of a minority stake may be accompanied by policies protective of the subsidiary that further limit the parent's financial flexibility, for instance restrictions on cash pooling with other members of the corporate family, limitations on dividends and distributions, or arms-length business requirements. Minority stakeholders may have seats on the board of the subsidiary. In many cases, we consider the impact of non-wholly owned subsidiaries qualitatively. However, in some cases we may find that an additional view of financial results, such as analyzing cash flows on a proportional consolidation basis, may be very useful to augment our analysis based on consolidated financial statements. When equity dilution or structural subordination arising from non-wholly owned subsidiaries is material and negative, the credit impact is captured in ratings but may not be fully reflected in scorecard-indicated outcomes.

For companies that hold material minority interest stakes, consolidated funds from operations typically includes the dividends received from the minority subsidiary, while none of its debt is consolidated. When such dividends are material to the company's cash flows, these cash flows may be subject to interruption if they are required for the minority subsidiary's debt service, capital expenditures or other cash needs. When minority interest dividends are material, we may also find that proportional consolidation or another additional view of financial results is useful to augment our analysis of consolidated financials. We would generally also consider structural subordination in these cases.[8] When these credit considerations are material, their impact is captured in ratings but may not be fully reflected in scorecard-indicated outcomes.

Event Risk

We also recognize the possibility that an unexpected event could cause a sudden and sharp decline in an issuer's fundamental creditworthiness, which may cause actual ratings to be lower than the scorecard-indicated outcome. Event risks — which are varied and can range from leveraged recapitalizations to sudden regulatory changes or liabilities from an accident — can overwhelm even a stable, well-capitalized firm. Some other types of event risks include M&A, asset sales, spin-offs, litigation, pandemics, significant cyber-crime events and shareholder distributions.

Parental Support

Ownership can provide ratings lift for a particular company in the steel sector if it is owned by a highly rated owner(s) and is viewed to be of strategic importance to those owners. In our analysis of parental support, we consider whether the parent has the financial capacity and strategic incentives to provide support to the issuer in times of stress or financial need (e.g., a major capital investment or advantaged supply agreement), or has already done so in the past. Conversely, if the parent puts a high dividend burden on the issuer, which in turn reduces its flexibility, the ratings would reflect this risk.

Government-related issuers may receive ratings uplift due to expected government support. However, for certain issuers, government ownership can have a negative impact on the underlying Baseline Credit Assessment.[9] For example, price controls, onerous taxation and high distributions can have a negative effect on an issuer's underlying credit profile.

Other Institutional Support

In some countries, large corporate issuers have received government or banking support in the event of financial difficulties because of their overall importance to the functioning of the economy. In Japan, our corporate ratings consider the support that has operated there for large and systemically important organizations. Over the years, this has resulted in lower levels of default than might otherwise have occurred. Our approach considers whether the presence of group and banking relationships may provide support when systemically important companies encounter significant financial stress.

Seasonality

Seasonality can be an important driver of customer demand and can cause swings in cash balances and working capital positions for some steel companies. Higher volatility creates less room for errors in product or operational execution.

Cyclical Sectors

Scorecard-indicated outcomes in cyclical sectors such as the steel sector may be higher than the rating at the top of the economic cycle and lower than the rating at the bottom of the cycle. While using annual financials in the scorecard typically provides very useful insights into recent or near-term results, ratings may also reflect our expectations for the progression of yearly results over a longer period that may include a full economic cycle. However, cyclicality itself poses many different types of risks to companies, and cycles do not reverse themselves with predictable regularity. A cyclical sector may also be affected by a secular decline or expansion. These considerations may be incorporated qualitatively in ratings.

Using the scorecard to arrive at a scorecard-indicated outcome

1. Measurement or estimation of factors in the scorecard

In the "Discussion of the scorecard factors" section, we explain our analytical approach for scoring each scorecard factor or sub-factor,[10] and we describe why they are meaningful as credit indicators.

The information used in assessing the sub-factors is generally found in or calculated from information in the company's financial statements or regulatory filings, derived from other observations or estimated by Moody's analysts. We may also incorporate non-public information.

Our ratings are forward-looking and reflect our expectations for future financial and operating performance. However, historical results are helpful in understanding patterns and trends of a company's performance as well as for peer comparisons. Financial ratios,[11] unless otherwise indicated, are typically calculated based on an annual or 12-month period. However, the factors in the scorecard can be assessed using various time periods. For example, rating committees may find it analytically useful to examine both historical and expected future performance for periods of several years or more.

All of the quantitative credit metrics incorporate our standard adjustments[12] to income statement, cash flow statement and balance sheet amounts for items such as underfunded pension obligations and operating leases. We may also make other analytical adjustments that are specific to a particular company.

2. Mapping scorecard factors to a numeric score

After estimating or calculating each factor or sub-factor, each outcome is mapped to a broad Moody's rating category (Aaa, Aa, A, Baa, Ba, B, Caa, Ca or C, also called alpha categories) and to a numeric score.

Qualitative factors are scored based on the description by broad rating category in the scorecard. The numeric value of each alpha score is based on the scale below.

Exhibit 3

Aaa	Aa	A	Baa	Ba	B	Caa	Ca	C
1	3	6	9	12	15	18	20	21

Source: Moody's Investors Service

Quantitative factors are scored on a linear continuum. For each metric, the scorecard shows the range by alpha category. We use the scale below and linear interpolation to convert the metric, based on its placement within the scorecard range, to a numeric score, which may be a fraction. As a purely theoretical example, if there were a ratio of revenue to interest for which the Baa range was 50x to 100x, then the numeric score for an issuer with revenue/interest of 99x, relatively strong within this range, would score closer to 7.5, and an issuer with revenue/interest of 51x, relatively weak within this range, would score closer to 10.5. In the text or table footnotes, we define the endpoints of the line (i.e., the value of the metric that constitutes the lowest possible numeric score, and the value that constitutes the highest possible numeric score).

Exhibit 4

Aaa	Aa	A	Baa	Ba	B	Caa	Ca	C
0.5-1.5	1.5-4.5	4.5-7.5	7.5-10.5	10.5-13.5	13.5-16.5	16.5-19.5	19.5-20.5	20.5-21.5

Source: Moody's Investors Service

3. Determining the overall scorecard-indicated outcome

The numeric score for each sub-factor (or each factor, when the factor has no sub-factors) is multiplied by the weight for that sub-factor (or factor), with the results then summed to produce an aggregate numeric score. The aggregate numeric score is then mapped back to a scorecard-indicated outcome based on the ranges in the table below.

Exhibit 5

Scorecard-indicated outcome

Scorecard-indicated outcome	Aggregate numeric score
Aaa	$x \leq 1.5$
Aa1	$1.5 < x \leq 2.5$
Aa2	$2.5 < x \leq 3.5$
Aa3	$3.5 < x \leq 4.5$
A1	$4.5 < x \leq 5.5$
A2	$5.5 < x \leq 6.5$
A3	$6.5 < x \leq 7.5$
Baa1	$7.5 < x \leq 8.5$
Baa2	$8.5 < x \leq 9.5$
Baa3	$9.5 < x \leq 10.5$
Ba1	$10.5 < x \leq 11.5$
Ba2	$11.5 < x \leq 12.5$
Ba3	$12.5 < x \leq 13.5$
B1	$13.5 < x \leq 14.5$
B2	$14.5 < x \leq 15.5$
B3	$15.5 < x \leq 16.5$
Caa1	$16.5 < x \leq 17.5$
Caa2	$17.5 < x \leq 18.5$
Caa3	$18.5 < x \leq 19.5$
Ca	$19.5 < x \leq 20.5$
C	$x > 20.5$

Source: Moody's Investors Service

For example, an issuer with an aggregate numeric score of 11.7 would have a Ba2 scorecard-indicated outcome.

In general, the scorecard-indicated outcome is oriented to the corporate family rating (CFR) for speculative-grade issuers and the senior unsecured rating for investment-grade issuers. For issuers that benefit from rating uplift from parental support, government ownership or other institutional support, we consider the underlying credit strength or Baseline Credit Assessment for comparison to the scorecard-indicated outcome. For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers.[13]

Assigning issuer-level and instrument-level ratings

After considering the scorecard-indicated outcome, other considerations and relevant cross-sector methodologies, we typically assign a CFR to speculative-grade issuers or a senior unsecured rating for investment-grade issuers. For issuers that benefit from rating uplift from government ownership, we may assign a Baseline Credit Assessment.[14]

Individual debt instrument ratings may be notched up or down from the CFR or the senior unsecured rating to reflect our assessment of differences in expected loss related to an instrument's seniority level and collateral. The documents that provide broad guidance for such notching decisions are the rating methodology on loss given default for speculative-grade non-financial companies, the methodology for notching corporate instrument ratings based on differences in security and priority of claim, and the methodology for assigning short-term ratings.[15]

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[16]

Limitations

In the preceding sections, we have discussed the scorecard factors and many of the other considerations that may be important in assigning ratings. In this section, we discuss limitations that pertain to the scorecard and to the overall rating methodology.

Limitations of the scorecard

There are various reasons why scorecard-indicated outcomes may not map closely to actual ratings.

The scorecard in this rating methodology is a relatively simple reference tool that can be used in most cases to approximate credit profiles of companies in this sector and to explain, in summary form, many of the factors that are generally most important in assigning ratings to these companies. Credit loss and recovery considerations, which are typically more important as an issuer gets closer to default, may not be fully captured in the scorecard. The scorecard is also limited by its upper and lower bounds, causing scorecard-indicated outcomes to be less likely to align with ratings for issuers at the upper and lower ends of the rating scale.

The weights for each factor and sub-factor in the scorecard represent an approximation of their importance for rating decisions across the sector, but the actual importance of a particular factor may vary substantially based on an individual company's circumstances.

Factors that are outside the scorecard, including those discussed above in the "Other considerations" section, may be important for ratings, and their relative importance may also vary from company to company. In addition, certain broad methodological considerations described in one or more cross-sector rating methodologies may be relevant to ratings in this sector.[17] Examples of such considerations include the following: how sovereign credit quality affects non-sovereign issuers, the assessment of credit support from other entities, the relative ranking of different classes of debt and hybrid securities, and the assignment of short-term ratings.

We may use the scorecard over various historical or forward-looking time periods. Furthermore, in our ratings we often incorporate directional views of risks and mitigants in a qualitative way.

General limitations of the methodology

This methodology document does not include an exhaustive description of all factors that we may consider in assigning ratings in this sector. Companies in the sector may face new risks or new combinations of risks, and they may develop new strategies to mitigate risk. We seek to incorporate all material credit considerations in ratings and to take the most forward-looking perspective that visibility into these risks and mitigants permits.

Ratings reflect our expectations for an issuer's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard inputs or in other considerations, typically diminishes. Our forward-looking opinions are based on assumptions that may prove, in hindsight, to have been incorrect. Reasons for this could include unanticipated changes in any of the following: the macroeconomic environment, general financial market conditions, industry competition, disruptive technology, or regulatory and legal actions. In any case, predicting the future is subject to substantial uncertainty.

Moody's related publications

Credit ratings are primarily determined through the application of sector credit rating methodologies. Certain broad methodological considerations (described in one or more cross-sector rating methodologies) may also be relevant to the determination of credit ratings of issuers and instruments. A list of sector and cross-sector credit rating methodologies can be found here.

For data summarizing the historical robustness and predictive power of credit ratings, please click here.

For further information, please refer to *Rating Symbols and Definitions*, which is available here.

Moody's Basic Definitions for Credit Statistics (User's Guide) can be found here.

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Endnotes

1 In a margin-on-metal construct, a company converts a metal into a higher-margin product.

2 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

3 In our methodologies and research, the terms "scorecard" and "grid" are used interchangeably.

4 Liquidity management is distinct from the level of liquidity, which is discussed in the "Other considerations" section.

5 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

6 A link to a list of our cross-sector methodologies can be found in the "Moody's related publications" section.

7 For example, in the case of an equity stake reduction in a subsidiary down to 75%, in the parent's financial statements, all revenue and EBITDA of the subsidiary would typically still be consolidated at the group level.

8 Proportional consolidation brings a portion of the minority subsidiary's debt onto the balance sheet, but this debt is structurally senior to debt at the parent company, because it is closer to the assets and cash flows of the minority subsidiary.

9 For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

10 Some factors do not have sub-factors, in which case we score at the factor level. When a factor comprises sub-factors, we score at the sub-factor level.

11 For definitions of our most common ratio terms, please see *Moody's Basic Definitions for Credit Statistics (User's Guide)*. A link can be found in the "Moody's related publications" section.

12 For an explanation of our standard adjustments, please see the cross-sector methodology that describes our financial statement adjustments in the analysis of non-financial corporations.

13 A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

14 For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

15 A link to a list of our sector and cross-sector rating methodologies can be found in the "Moody's related publications" section.

16 A link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

17 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

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