MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY
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Analyst Contacts

Sandra Beltran +52.55.1253.5718
VP-Senior Analyst
sandra.beltran@moodys.com

Griselda Bisono +1.212.553.4985
VP-Senior Analyst
griselda.bisono@moodys.com

Emile El Nems +1.212.553.6849
VP-Senior Analyst
emile.elnems@moodys.com

Gerwin Ho +852.3758.1566
VP-Sr Credit Officer
gerwin.ho@moodys.com

Vitali Morgovski, CFA +49.69.70730.767
AVP-Analyst
vitali.morgovski@moodys.com

Roy Zhang +852.3758.1515
VP-Senior Analyst
roy.zhang@moodys.com

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Rating Methodology

Building Materials

This rating methodology replaces the *Building Materials* methodology published in May 2019. 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, sale and distribution of building materials, such as cement, concrete, aggregates, gypsum, bricks and roof tiles.

Companies that are primarily engaged in the construction or refurbishment of infrastructure or buildings for commercial or public use are rated under our methodology that describes our general approach for rating construction companies.[1] Companies that are primarily engaged in the construction and sale of finished single- and multi-family housing and large-scale residential apartments are covered under our methodology that describes our general approach for rating homebuilding and property development companies.

*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.

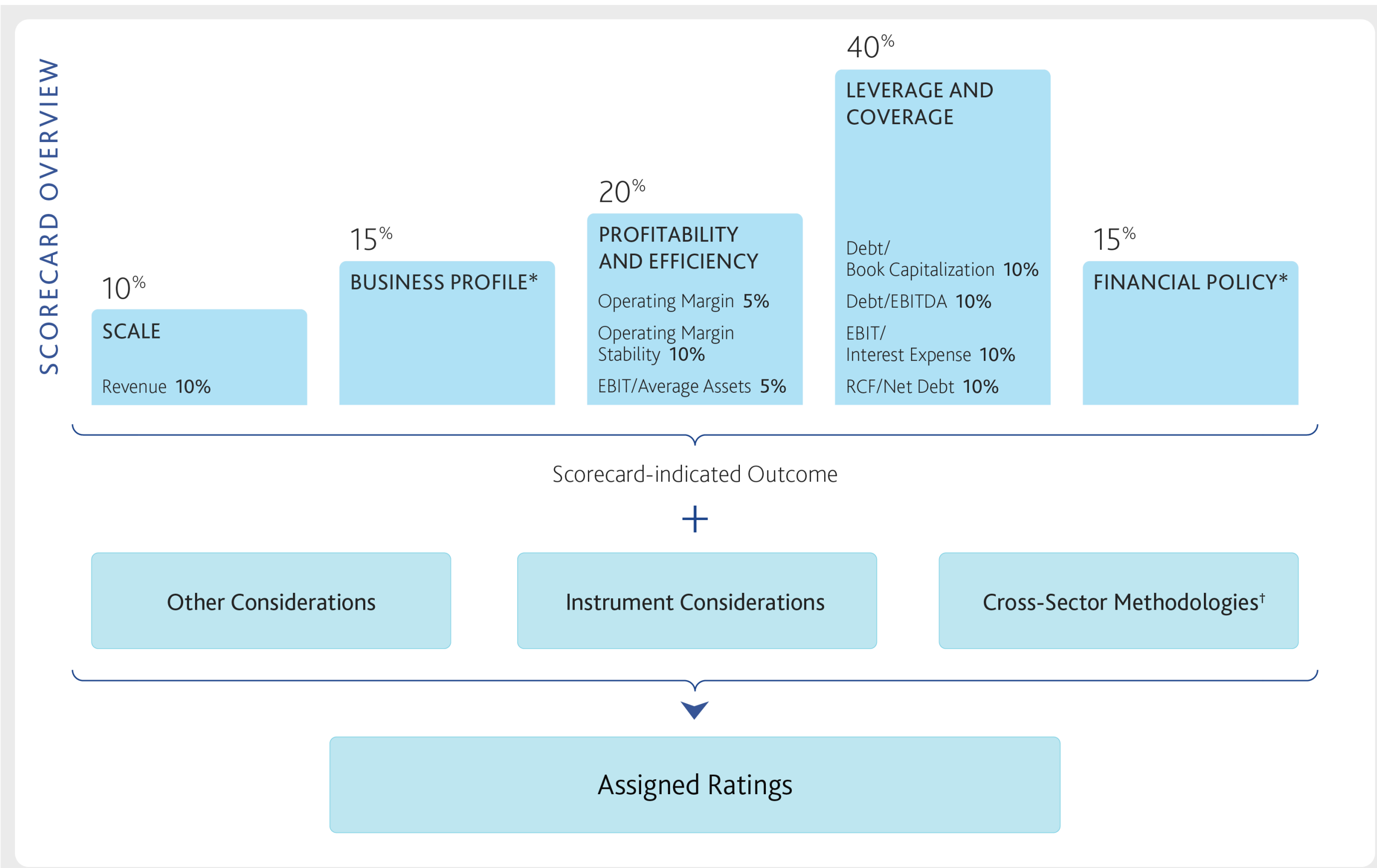
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the building materials industry 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 building materials companies, which includes the use of a scorecard.[2] 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 building materials 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

Building materials 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

Building materials scorecard

	SCALE (10%)	BUSINESS PROFILE (15%)	PROFITABILITY and EFFICIENCY (20%)			LEVERAGE and COVERAGE (40%)					FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Business Profile (15%)	Operating Margin[2] (5%)	Operating Margin Stability (10%)	EBIT / Average Assets[3] (5%)	Debt / Book Capital-ization[4] (10%)	Debt / EBITDA[5] (10%)	EBIT / Interest Expense[6] (10%)	RCF / Net Debt[7] (10%)		Financial Policy (15%)
Aaa	≥ $50	Exceptional geographic diversity in emerging and developed countries on several continents; exclusive provider of extremely diverse group of products; extremely high barriers to entry in essentially all products; extremely high degree of vertical integration; and essentially no risk from carbon regulation and a potential competitive advantage.	≥ 40%	Essentially no volatility of operating margin throughout cycles; essentially no revenue volatility; extremely diverse mix of residential, commercial and infrastructure end-markets; extremely high share of revenue from renovation; extremely strong record of quickly passing on price increases to customers; and extremely low-cost operations with very significant structural cost advantages, and a highly variable cost base.	≥ 25%	≤ 20%	≤ 0.5x	≥ 20x	≥ 70%		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	$30 - $50	Excellent geographic diversity in emerging and developed countries on several continents; highly diverse group of products and No. 1 or No. 2 market positions in majority of products; very high barriers to entry in most product; very high degree of vertical integration; essentially no risk from carbon regulation.	30% - 40%	Very low volatility of operating margin throughout cycles; very low revenue volatility; highly diverse mix of residential, commercial and infrastructure end-markets; very high share of revenue from renovation; very strong record of quickly passing on price increases to customers; and very low-cost operations with significant structural cost advantages and a highly variable cost base.	15% - 25%	20% - 30%	0.5x - 1x	15x - 20x	50% - 70%		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	$15 - $30	Very good geographic diversity in emerging and developed countries on at least two continents; well-diversified group of products and No. 1, No. 2 or No. 3 market positions in majority of products; high barriers to entry in most products; high degree of vertical integration; very limited risk from carbon regulation.	20% - 30%	Low volatility of operating margin throughout cycles; low revenue volatility; well-diversified mix of residential, commercial and infrastructure end-markets; high share of revenue from renovation; strong record of quickly passing on price increases to customers; moderately low-cost operations with structural cost advantages and a variable cost base.	10% - 15%	30% - 40%	1x - 2x	7x - 15x	35% - 50%		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 (10%)	BUSINESS PROFILE (15%)	PROFITABILITY and EFFICIENCY (20%)			LEVERAGE and COVERAGE (40%)				FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Business Profile (15%)	Operating Margin[2] (5%)	Operating Margin Stability (10%)	EBIT / Average Assets[3] (5%)	Debt / Book Capital-ization[4] (10%)	Debt / EBITDA[5] (10%)	EBIT / Interest Expense[6] (10%)	RCF / Net Debt[7] (10%)	Financial Policy (15%)
Baa	$5 - $15	Good geographic diversity in emerging and developed countries on at least two continents; diverse group of products, with moderately strong market positions in majority of products; high barriers to entry in key products; somewhat high degree of vertical integration; limited carbon regulation risk.	15% - 20%	Moderate volatility of operating margin throughout cycles; moderate revenue volatility; diverse mix of residential, commercial and infrastructure end-markets; moderately high share of revenue from renovation; moderately strong record of quickly passing on price increases to customers; low-cost operations with some structural cost advantages and some variability in cost base.	7.5% - 10%	40% - 50%	2x - 3.5x	4.5x - 7x	20% - 35%	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	$1.5 - $5	Moderate geographic diversity; moderately diverse group of products, with moderate market positions; moderately high barriers to entry in some products; moderate vertical integration; moderate carbon regulation risk.	10% - 15%	Somewhat elevated volatility of operating margin throughout cycles; somewhat elevated revenue volatility; business mix is fairly concentrated in residential and commercial end-markets with low exposure to infrastructure; moderately low share of revenue from renovation; moderately strong record of passing on price increases to customers, but with some time lag; moderately high-cost operations with no meaningful cost advantages but some variability in cost base.	4% - 7.5%	50% - 70%	3.5x - 4.5x	3x - 4.5x	10% - 20%	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	$0.5 - $1.5	Low geographic diversity; product concentration or weak market positions; low barriers to entry in most products; limited vertical integration; high carbon regulation risk.	5% - 10%	Substantial volatility of operating margin throughout cycles; substantial revenue volatility; business mix is very concentrated in residential and commercial end-markets with very low exposure to infrastructure; low share of revenue from renovation; weak record of passing on price increases to customers and with a time lag; high-cost operations with limited variability in cost base.	2% - 4%	70% - 80%	4.5x - 6x	1x - 3x	5% - 10%	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 (10%)	BUSINESS PROFILE (15%)	PROFITABILITY and EFFICIENCY (20%)		LEVERAGE and COVERAGE (40%)					FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Business Profile (15%)	Operating Margin[2] (5%)	Operating Margin Stability (10%)	EBIT / Average Assets[3] (5%)	Debt / Book Capital-ization[4] (10%)	Debt / EBITDA[5] (10%)	EBIT / Interest Expense[6] (10%)	RCF / Net Debt[7] (10%)	Financial Policy (15%)
Caa	$0.25 - $0.5	Regional or niche provider with high product concentration or very weak market positions; very low barriers to entry in most products; minimal vertical integration; or very high carbon regulation risk.	2.5% - 5%	High volatility of operating margin throughout cycles; high revenue volatility; business mix is highly concentrated in residential and commercial end-markets with extremely low exposure to infrastructure; or extremely low share of revenue from renovation; very weak record of passing on price increases to customers; or very high-cost operations with very limited variability in cost base.	1% - 2%	80% - 90%	6x - 7x	0.5x - 1x	2.5% - 5%	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	< $0.25	Regional or niche provider with very high product concentration or extremely weak and eroding market positions; essentially no barriers to entry in essentially all product lines; essentially no vertical integration; or extremely high carbon regulation risk.	< 2.5%	Extremely high volatility of operating margin throughout cycles; extremely high revenue volatility; business mix is concentrated in residential and commercial end-markets with no exposure to infrastructure; or no revenue from renovation; extremely weak record of quickly passing on price increases to customers; or extremely high-cost operations with extremely limited variability in cost base.	< 1%	> 90%	> 7x	< 0.5x	< 2.5%	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.

[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 Ca endpoint value is zero. A value of zero equates to a numeric score of 20.5.
[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 Ca endpoint value is 0%. A value of 0% or worse equates to a numeric score of 20.5.
[3] For the linear scoring scale, the Aaa endpoint value is 40%. A value of 40% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% or worse equates to a numeric score of 20.5.
[4] For the linear scoring scale, the Aaa endpoint value is zero. A value of 0% equates to a numeric score of 0.5. The Ca endpoint value is 110%. A value of 110% or worse equates to a numeric score of 20.5, as does a negative Debt/Book Capitalization value.
[5] For the linear scoring scale, the Aaa endpoint value is 0x. A value of 0x equates to a numeric score of 0.5. The Ca endpoint value is 9x. A value of 9x or worse equates to a numeric score of 20.5, as does a negative Debt/EBITDA value.
[6] For the linear scoring scale, the Aaa endpoint value is 30x. A value of 30x or better equates to a numeric score of 0.5. The Ca endpoint value is 0x. A value of 0x or worse equates to a numeric score of 20.5, as does negative EBIT.
[7] For the linear scoring scale, when net debt is positive, the Aaa endpoint value is 90%. A value of 90% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% or worse equates to a numeric score of 20.5. When net debt is negative and RCF is positive, the numeric score is 0.5. When net debt is negative and RCF is negative or zero, the numeric score is 20.5.
Source: Moody's Investors Service

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 (10% weight)

Why it matters

Scale is an important indicator of a company's revenue-generating capability and its resilience to shocks, such as sudden shifts in demand or rapid cost increases. Large-scale companies generally have more flexibility to allocate capacity and absorb expenses under different demand and cost scenarios than small-scale companies, an important consideration in the highly cyclical building materials industry.

How we assess it for the scorecard

REVENUE:

Scale is measured (or estimated in the case of forward-looking expectations) using total reported revenue in billions of US dollars.

Factor: Business Profile (15% weight)

Why it matters

The business profile of a building materials company greatly influences its ability to generate sustainable earnings and operating cash flows. Core aspects of a building materials company's business profile include its geographic diversity, market position, product diversity, barriers to entry, degree of vertical integration and exposure to carbon regulation.

Geographic diversity is an important credit strength because of the industry's vulnerability to economic downturns. The fundamental business drivers affecting building materials companies are generally correlated with gross domestic product (GDP) growth and construction activity. A company with greater geographic diversity can typically better withstand local or regional economic weakness than one that is geographically concentrated. Exposure to emerging markets can improve a company's growth prospects because the consumption of building materials as a percentage of GDP typically rises with growth in GDP per capita. However, emerging markets generally exhibit greater volatility in economic growth than developed markets, underscoring the importance of geographic diversity.

A company's market position is a meaningful indicator of its resilience to economic downturns and intensifying competition. Companies with leading market positions are generally more likely to pass on increases in input costs to customers. Although few viable alternatives to the sector's core products exist at similar price points, which diminishes secular pressure and technology risk, product diversity is important because it helps companies manage revenue weakness or rising costs, whether due to competitive or cyclical conditions, in any one product line.

Barriers to entry, which can vary by region and product line, are also critical because they help strongly established companies defend their market positions, and high entry barriers make it difficult for new entrants to gain share.

Vertical integration is another important aspect of a company's business profile. A company that produces its own raw materials, converts the materials into finished goods and distributes those goods is less reliant on other companies and therefore more in control of its cost base.

Carbon regulation is an important consideration because it could increase costs for the energy-intensive building materials sector if companies cannot pass on compliance costs to customers or reduce their carbon emissions. The impact of carbon regulation varies among issuers because of disparate regulations across regions and products, and because of the different energy intensity involved with producing various building materials, again highlighting the importance of geographic and product diversification.

How we assess it for the scorecard

Scoring for this factor is based on a qualitative assessment of a company's geographic diversity, market position, product diversity, barriers to entry, degree of vertical integration and exposure to carbon regulation.

In assessing geographic diversity, we typically consider the amount of revenue a company receives from customers in each country in which it operates,[3] as well as whether their economies are developed or emerging.

We typically assess a company's market position within a given country, in light of the very local nature of the business given the low value-to-weight ratio of products sold.[4] Companies with leading market positions and high market share generally score higher than those with weak market positions and low market share. We assess product diversity by considering the number of discrete product segments of a company. Examples of product segments include cement, ready-mixed concrete and aggregates.

Our assessment of barriers to entry generally considers the company's regions and product segments. We may consider the company's access to pits and quarries necessary to extract raw materials from the ground as well as its production and distribution network. Rights and permits to extract raw materials can also be a strong barrier to entry.

Our assessment of barriers to entry typically considers the company's regions and product segments. Different product segments generally require different levels of start-up investment. Also, the generally high transport costs and low value-to-weight ratio of many building materials create regional barriers to entry, because transport costs of heavy products rise rapidly with distance from the plant location. In the cement market, for example, the high cost of building a plant and creating efficient distribution channels reduces the likelihood of new entrants, relative to a lighter-weight product, such as ceramics. As another example, the aggregates business requires significantly less upfront investment than the cement business, reducing barriers to entry.

Our assessment of vertical integration is related to our evaluation of product diversity in terms of product breadth, but also considers whether the company produces its own raw materials and has its own distribution channel for those products, or whether it relies on other companies for raw materials and the distribution of its products. For example, a company that produces cement, transforms it into ready-mixed concrete, and distributes it to the end customer typically scores higher than one that produces cement but does not add value to it or distribute it, or one that relies on other companies for raw materials and for distribution of its products.

In assessing a building materials company's exposure to carbon regulation, we generally consider existing and expected regulations within a company's geographic footprint, its product segments and any steps it has taken to mitigate regulatory risk or gain a competitive advantage. For example, cement production emits more carbon than other building products, such as ceramics, so a company that derives most of its revenue from the cement market typically has greater carbon regulation risk. A company can reduce carbon emissions by investing in technology such as carbon capture storage or by shifting its product portfolio to products with lower energy intensity, thereby lowering its risk or creating competitive advantages.

Generally, we do not expect a given company's business profile to exactly match each of the attributes listed for a given scoring category. We typically assign the factor score based on the alpha category for which the issuer has the greatest number of characteristics. However, there may be cases in which one characteristic is sufficiently important to a particular issuer's credit profile that it has a large influence on the factor score. For example, reliance on a single region or product line may limit the score to the Ba category or lower even if the company's market position is strong and its carbon regulation risk is low, because the business risk in these cases is typically high.

Factor: Profitability and Efficiency (20% weight)

Why it matters

Profits matter because they are needed to generate sustainable cash flow and maintain a competitive position. A company's ability to manage its overall costs provides an important indication of its ability to maintain its operations through economic downturns while continuing to pay its debt service.

This factor comprises two quantitative sub-factors and one qualitative sub-factor:

Operating Margin

Operating margin provides indications of a company's competitive strength and operating efficiency as well as the effectiveness of management. We use operating income, a measure or estimate of profitability before interest, taxes and unusual items but after depreciation costs, because reinvestment is typically essential for a company to maintain its market position.

Operating Margin Stability

Operating margin stability is an indicator of a company's ability to manage its revenue and costs through economic cycles. As operating margin volatility increases, predictability of cash flow decreases, leaving companies with less flexibility to service debt or invest in operations. Conversely, a company with a more stable operating margin can more consistently fund debt obligations and invest in its business, making it more likely to maintain or improve its competitive position through different economic conditions.

Drivers of operating margin stability include revenue and costs, so the stability of the company's end markets, its ability to pass on price increases and its flexibility to manage its cost base (including energy, which typically makes up a significant portion of total costs for a building materials company) are important considerations.

EBIT / Average Assets

The ratio of earnings before interest and taxes to average assets is an indicator of a company's ability to generate a meaningful return relative to the level of investment in its asset base. It provides indications of a company's investment decisions over time, a critical consideration for this capital-intensive sector.

How we assess it for the scorecard

Scoring for this factor is based on three sub-factors: Operating Margin; Operating Margin Stability; and EBIT/Average Assets.

OPERATING MARGIN:

The numerator is operating income, and the denominator is revenue.

OPERATING MARGIN STABILITY:

Scoring for this sub-factor is based on a qualitative assessment of the company's operating margins throughout varying economic conditions.

We typically assess how much revenue a company receives from each of three end markets, including the residential, commercial and infrastructure end markets. Companies with a high concentration of revenue in any one end market generally receive lower scores for this sub-factor than companies with diversified exposure to all three end markets. Of the three end markets, exposure to the infrastructure end market is likely to support a higher score for this sub-factor than the other markets, because infrastructure spending is generally more resilient during economic downturns. Governments may invest in infrastructure projects as a contra-cyclical measure, and although spending can rise or drop based on budget approval, both projects and government budgets typically span multiple years, lending predictability once budgets are approved.

Companies that receive a high level of revenue from the renovation segment may receive higher scores for this sub–factor than companies that do not, because end customers are more likely to spend on renovation projects than on new construction during economic downturns.

Another consideration for a company's revenue stability is its ability to pass on price increases to customers. We generally assess the company's cost base relative to its peers, and a company with low-cost operations, structural cost advantages and a variable cost base typically scores higher for this sub-factor than a company with higher-cost operations and a highly fixed cost base. A company may derive structural cost advantages from, for example, proximity to customers or lower cost access to raw materials. Our assessment of the cost base may also consider the company's overall energy costs and its flexibility to switch between fuel sources.

EBIT / AVERAGE ASSETS:

The numerator is EBIT, and the denominator is total assets averaged over the past two years.

Factor: Leverage and Coverage (40% weight)

Why it matters

Leverage and cash flow coverage measures provide important indications of a company's financial flexibility and long-term viability. These metrics can also provide insight into management's philosophy regarding the company's capital structure and how much financial risk it is willing to undertake.

This factor comprises four quantitative sub-factors:

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.

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.

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.

RCF / Net Debt

The ratio of retained cash flow to net debt (RCF/Net Debt) is an indicator of a company's cash generation (before working capital movements and capital expenditures, and after dividend payments) relative to its net debt (total debt minus cash and cash equivalents).

How we assess it for the scorecard

Scoring for this factor is based on four sub-factors: Debt/Book Capitalization; Debt/EBITDA; EBIT/Interest Expense; and RCF/Net Debt.

DEBT / BOOK CAPITALIZATION:

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

DEBT / EBITDA:

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

EBIT / INTEREST EXPENSE:

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

RCF / NET DEBT:

The numerator is retained cash flow, and the denominator is net debt (total debt minus cash and cash equivalents).

Factor: Financial Policy (15% weight)

Why it matters

Financial policy encompasses management and board tolerance for financial risk and commitment to a strong credit profile. It is an important rating determinant, because it directly affects debt levels, credit quality, the future direction for the company and the risk of adverse changes in financing and capital structure.

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[5] 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. 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.

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 debtholders' interests. A track record of favoring shareholder returns at the expense of debtholders 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.

Regulatory Considerations

Companies in the building materials sector are subject to varying degrees of regulatory oversight. Effects of these regulations may entail limitations on operations, higher costs, and higher potential for technology disruptions and demand substitution. Regional differences in regulation, implementation or enforcement may advantage or disadvantage particular issuers.

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 a company to generate sufficient cash flows relative to its debt burden over the medium and longer term. Regulatory considerations may also play a role in our assessment of a company's business profile or operating margin stability. In some circumstances, regulatory considerations may also be a rating factor outside the scorecard, for instance when regulatory change is swift.

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in the building materials sector. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[6]

Increasing environmental requirements and efforts to reduce greenhouse gas emissions (known as carbon transition risk) may lead to higher costs for building materials companies, especially cement producers. Stricter air pollution standards could also increase costs. Inability to pass compliance costs on to customers could erode profitability and cash flow generation. Disparities in regulations and associated costs are likely to favor some companies and create competitive challenges for others. Our expectation for environmental considerations may be an important aspect of our assessment of a company's business profile, and our expectation for fuel costs may play a role in our assessment of the operating margin stability sub-factor score.

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.

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 adhering to stated plans, commitments and guidelines provides insight into management's likely future performance, including in stressed situations.

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 two leverage ratios with total (or gross) debt (Debt/Book Capitalization and Debt/EBITDA), we do consider excess cash holdings in our rating analysis, including in our assessment of the financial and liquidity policy. For companies 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. In cases where we believe that cash on the balance sheet does not confer meaningful credit support, we are more likely to cite gross debt ratios in our credit analysis, press releases and rating threshold levels. For example, a company may have difficulty quickly repatriating cash from subsidiaries in geographic locations separate from the primary operations. Also, for a rated company with a majority ownership position in another company, the consolidation of financial statements results in the reporting of all of the partially owned company's cash on the consolidated balance sheet of the rated company. In both of these instances, not all of the cash on the balance sheet may be readily available for debt repayment or other liquidity needs.

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.

Liquidity

Liquidity is an important rating consideration for all building materials 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 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.[7]

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 building materials 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.[8] The parent's share of dividend flows from a non-wholly owned subsidiary are 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.[9] 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, capital restructuring programs, litigation, pandemics, significant cyber-crime events and shareholder distributions.

Parental Support
Ownership can provide ratings lift for a particular company in the building materials 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 operating 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.[10] For example, price controls, onerous taxation and high distributions can have a negative effect on an issuer's underlying credit profile.

Seasonality
Seasonality is an important driver of customer demand and can cause swings in cash balances and working capital positions for issuers. Higher volatility creates less room for errors in meeting customer demand or operational execution. Construction activities typically need to occur during mild weather conditions, which leads to a peak demand for building materials in summer and low levels of activity and demand in winter. Building materials companies may also use cold weather periods for extended maintenance activities, which may amplify seasonality effects. Seasonality effects vary depending on the products, so companies that rely heavily on a particular season for sales may have greater earnings and cash flow volatility.

Cyclical Sectors
Scorecard-indicated outcomes in cyclical sectors 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,[11] 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,[12] 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[13] 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 or Ca, 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
1	3	6	9	12	15	18	20

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
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

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 ≤ 1.5
Aa1	1.5 < x ≤ 2.5
Aa2	2.5 < x ≤ 3.5
Aa3	3.5 < x ≤ 4.5
A1	4.5 < x ≤ 5.5
A2	5.5 < x ≤ 6.5
A3	6.5 < x ≤ 7.5
Baa1	7.5 < x ≤ 8.5
Baa2	8.5 < x ≤ 9.5
Baa3	9.5 < x ≤ 10.5
Ba1	10.5 < x ≤ 11.5
Ba2	11.5 < x ≤ 12.5
Ba3	12.5 < x ≤ 13.5
B1	13.5 < x ≤ 14.5
B2	14.5 < x ≤ 15.5
B3	15.5 < x ≤ 16.5
Caa1	16.5 < x ≤ 17.5
Caa2	17.5 < x ≤ 18.5
Caa3	18.5 < x ≤ 19.5
Ca	19.5 < x ≤ 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 to 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.[14]

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.[15]

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.[16]

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[17]

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 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.[18] 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.

Author:

Karen Berckmann

Endnotes

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

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

3 Because building materials companies typically sell their products within the region of their operations due to generally high transport costs, the proportion of revenue companies receive from operations each country relative to the assets in each country is generally fairly comparable.

4 In assessing a company's market position, we typically consider market share, which we estimate based generally on information provided by third parties and by issuers.

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

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

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

8 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.

9 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.

10 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.

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

12 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.

13 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.

14 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 or 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.

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

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

18 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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Analyst Contacts

Gretchen French +1.212.553.3798
Associate Managing Director
gretchen.french@moodys.com

Marcos Schmidt +55.11.3043.7310
Associate Managing Director
marcos.schmidt@moodys.com

Anke Rindermann +49.69.70730.788
Associate Managing Director
anke.rindermann@moodys.com

Clement Wong +852.3758.1561
Associate Managing Director
clement.wong@moodys.com

CLIENT SERVICES

Americas 1-212-553-1653

Asia Pacific 852-3551-3077

Japan 81-3-5408-4100

EMEA 44-20-7772-5454

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