MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY
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TABLE OF CONTENTS

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Rating Methodology

Protein and Agriculture

This rating methodology replaces the *Protein and Agriculture* 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 producing and processing animal protein and agricultural products, including beef, pork, chicken, seafood, eggs, fluid milk, fresh fruit and vegetables, edible oils, beans, leaf tobacco, sugar and chocolate.

Companies that are primarily engaged in trading agricultural commodities, and companies that are primarily engaged in making consumer products, including packaged food and cigarette makers, are rated under other methodologies.[1]

*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.

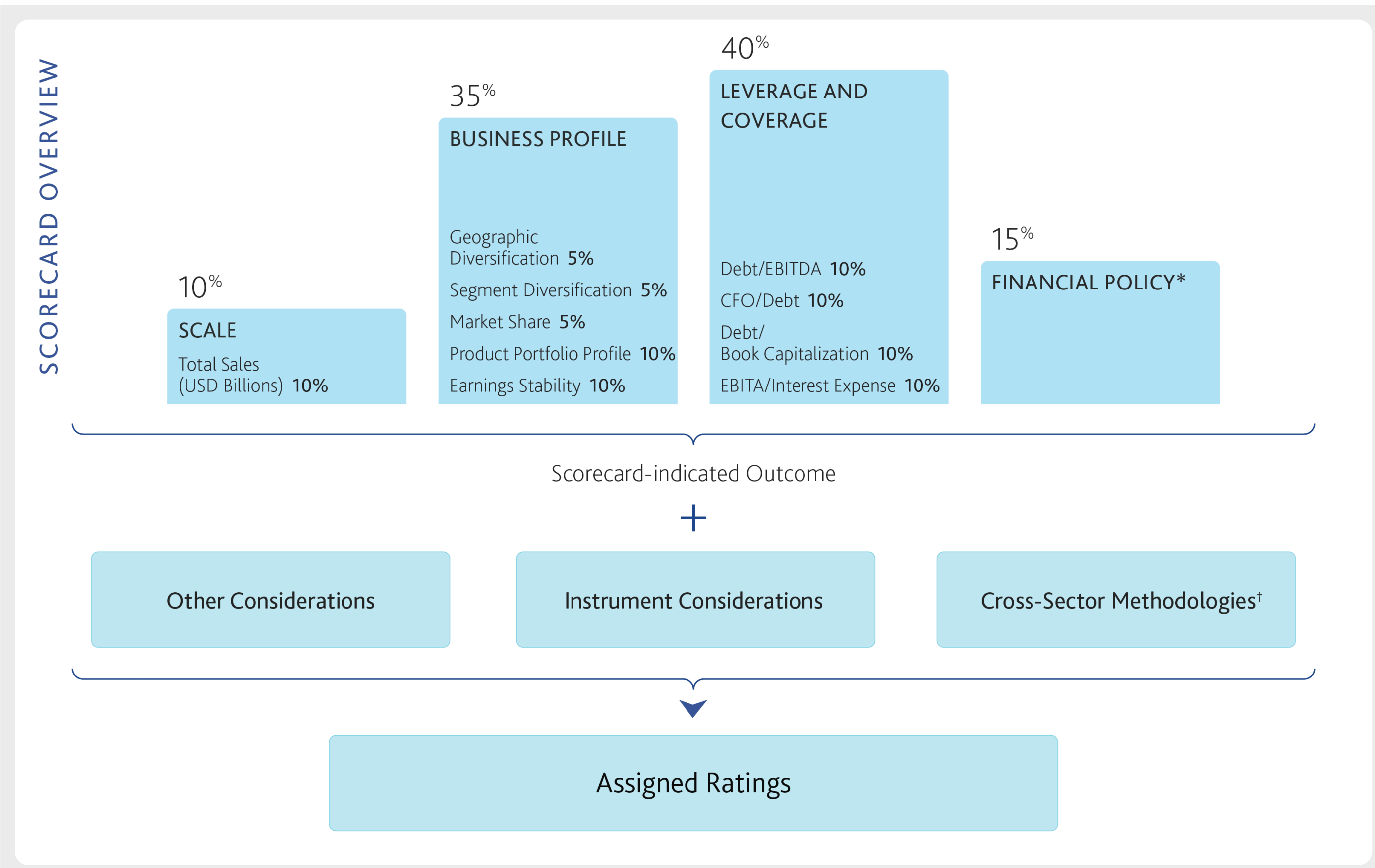
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the protein and agriculture 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 protein and agriculture 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 protein and agriculture 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

Protein and agriculture 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

Protein and agriculture scorecard

	SCALE (10%)	BUSINESS PROFILE (35%)					LEVERAGE and COVERAGE (40%)				FINANCIAL POLICY (15%)
	Total Sales (USD Billions)[1] (10%)	Geographic Diversification (5%)	Segment Diversification (5%)	Market Share (5%)	Product Portfolio Profile (10%)	Earnings Stability (10%)	Debt / EBITDA[2] (10%)	CFO / Debt[3] (10%)	Debt / Book Capital-ization[4] (10%)	EBITA / Interest Expense[5] (10%)	Financial Policy (15%)
Aaa	≥ $60	Very low sales concentration, typically < 10%; very high percentage of sales to large, stable, mature markets, typically > 95%; very low raw material supply concentration.	8 or more profitable core segments balanced in terms of sales and profitability.	Global player, expected to have #1 global market share in all key business segments with at least triple the share of #2 player.	Substantially all strong value-added; very strong brands and very high innovation capacity.	Operating profits are extremely stable, and no potential for short-term earnings volatility.	≤ 0.25x	≥ 70%	≤ 20%	≥ 20x	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 - $60	Low sales concentration, typically < 25%; high percentage of sales to large, stable, mature markets, typically > 85%; low raw material supply concentration.	6 or more profitable core segments balanced in terms of sales and profitability.	Global player, expected to have #1 global market share in all key business segments with at least double the share of #2 player.	Mostly high value-added; strong brands and high innovation capacity.	Operating profits are very stable and predictable; and extremely low potential for short-term earnings volatility.	0.25x - 1x	50% - 70%	20% - 25%	15x - 20x	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	Low sales concentration, typically < 35%; high percentage of sales to large, stable, mature markets, typically > 75%; low raw material supply concentration.	4 - 5 profitable core segments balanced in terms of sales and profitability.	Global player, expected to have #1 global market share in all key business segments with at least 1.5x the share of the #2 player.	Mostly high value-added; solid brands and good innovation capacity.	Operating profits are very stable and predictable; and very low potential for short-term earnings volatility due to business or commodity cycles.	1 x - 2x	35% - 50%	25% - 35%	9x - 15x	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 (35%)					LEVERAGE and COVERAGE (40%)				FINANCIAL POLICY (15%)
	Total Sales (USD Billions)[1] (10%)	Geographic Diversification (5%)	Segment Diversification (5%)	Market Share (5%)	Product Portfolio Profile (10%)	Earnings Stability (10%)	Debt / EBITDA[2] (10%)	CFO / Debt[3] (10%)	Debt / Book Capital-ization[4] (10%)	EBITA / Interest Expense[5] (10%)	Financial Policy (15%)
Baa	$7.5 - $15	Moderate sales concentration, typically < 50%; high percentage of sales to large, stable, mature markets, typically >75%; moderate raw material supply concentration.	3 core segments balanced in terms of sales and profitability.	Global player, expected to have at least #2 global market share in all key business segments.	Moderate value-added; some solid regional brands and some innovation capacity with sensitivity to competition or consumption trends.	Operating profits are relatively stable over long term; but can vary over short periods due to business or commodity cycles; rational industry supply discipline.	2x - 3x	25% - 35%	35% - 45%	6x - 9x	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	$3 - $7.5	Moderately high sales concentration, typically < 75%; moderate percentage of sales to large, stable, mature markets, typically > 50%; moderate raw material supply concentration.	2 - 3 segments that are each significant contributors to sales and profitability.	Expected to have at least #2 major regional market share in key segments.	Moderate value-added; low brand strength or largely commoditized or vulnerable to commodity cycles, competition or consumption trends.	Operating profits are relatively predictable over long term; but can be volatile over short periods; during cyclical downturns may generate small quarterly operating losses followed by a reliable recovery; rational industry supply discipline.	3x - 4x	15% - 25%	45% - 60%	3x - 6x	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 - $3	High sales concentration, typically > 75%; primary market is large, stable, mature market with secondary markets that may include small, unstable or emerging markets; moderate raw material supply concentration.	1 - 2 segments but heavy reliance on 1 segment for profitability.	Expected to have a #3 or weaker regional market share; a second-tier market participant.	Low value-added; mostly commodity-like products vulnerable to commodity cycles, new competition, or consumption trends.	Operating profits can be volatile and unpredictable; during cyclical downturns may generate large quarterly operating losses usually followed by equally strong recoveries; possibly weak industry supply discipline; or below average operating efficiency.	4x - 6x	7.5% - 15%	60% - 75%	1x - 3x	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 (35%)					LEVERAGE and COVERAGE (40%)				FINANCIAL POLICY (15%)
	Total Sales (USD Billions)[1] (10%)	Geographic Diversification (5%)	Segment Diversification (5%)	Market Share (5%)	Product Portfolio Profile (10%)	Earnings Stability (10%)	Debt / EBITDA[2] (10%)	CFO / Debt[3] (10%)	Debt / Book Capital-ization[4] (10%)	EBITA / Interest Expense[5] (10%)	Financial Policy (15%)
Caa	$0.25 - $1	High sales concentration, typically > 75%; primary market is small, unstable or emerging; secondary markets may include some large, stable or mature markets; high raw material supply concentration.	1 core segment that experiences volatile profitability.	Expected to have small regional market share, or be a niche producer with limited customer base.	Mostly commodity products; little or no value-added products highly vulnerable to competition, commodity cycles or consumption trends.	Operating profits can be volatile and unpredictable; during cyclical downturns may generate large losses that can be persistent; weak industry supply discipline or weak average operating efficiency.	6x - 8x	2.5% - 7.5%	75% - 90%	0.5x - 1x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	< $0.25	Very high sales concentration, typically > 90%; primary market is small, unstable or emerging; secondary markets include some large, stable or mature markets; high raw material supply concentration.	1 core segment that experiences regular swings to significant operating losses.	Evolving or vulnerable market share position due to corporate restructuring, market or technology disruptions; shifting customer relationships.	Predominantly commodity products; little or no value-added products extremely vulnerable to competition, commodity cycles or consumption trends.	Operating profits are volatile and unpredictable throughout the cycle; can generate large losses that can be persistent; or very weak industry supply discipline or weak average operating efficiency.	> 8x	< 2.5%	> 90%	< 0.5x	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 or worse equates to a numeric score of 20.5.
[2] For the linear scoring scale, the Aaa endpoint value is zero. A value of zero or better equates to a numeric score of 0.5. The Ca endpoint value is 12x. A value of 12x or worse equates to a numeric score of 20.5, as does a negative Debt/EBITDA value.
[3] For the linear scoring scale, the Aaa endpoint value is 100%. A value of 100% or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero or worse equates to a numeric score of 20.5.
[4] For the linear scoring scale, the Aaa endpoint value is 10%. A value of 10% or better equates to a numeric score of 0.5. The Ca endpoint value is 95%. A value of 95% 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 30x. A value of 30x or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero or worse equates to a numeric score of 20.5.
Source: Moody's Investors Service

Sector overview

Demand for food products broadly follows population trends and expanding middle-class demographics. Because commodity protein and agricultural products are essential, consumption volume, especially for products used in further-processed foods, tends not to fluctuate widely. In some circumstances, demand can be affected by regulations, such as trade barriers or safety restrictions, or by competition from other industries for food products or for raw materials (e.g., corn for use in ethanol production).

Companies in the sector nevertheless show substantial volatility in earnings and cash flows owing to shifts in product supply or input costs. Many products in this sector are largely undifferentiated and are of fairly uniform quality, and numerous global companies provide them. In addition, protein and agriculture product prices among markets are typically interrelated, to the extent that there are limited restrictions on trade. For some sub-sectors, such as animal feed material (including corn and soybeans) in the protein sector, the supply and cost of raw materials can be sharply influenced by events that cannot be controlled, such as plant or livestock diseases, weather conditions or trade restrictions.

Safety and product quality issues can also drive volatility. Sales of a company's product can quickly decline in the event of a recall due to safety concerns. The risk is typically higher for companies that sell products that require, under relevant regulation, time and temperature control to ensure their safety for human consumption. Such foods can include meats, fish, eggs, onions, soy products, cut melons, and certain sauces and pastries.

Customers of protein and agriculture companies include end consumers, food service providers, retailers and processed food manufacturers. Companies may not be able to pass along higher costs to customers without hurting sales volume, because customers can switch to other suppliers and consumers are able to substitute proteins. In addition, management's ability to control product supply can be limited by the availability of hedging vehicles, the time to raise animals, crop cycles or production efficiency, among other reasons.

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.

Companies that are large in scale tend to have lower marginal costs, including those associated with manufacturing, sales force, distribution, and research and development. Larger companies also tend to have more bargaining power with purchasing organizations, customers and suppliers.

How we assess it for the scorecard

TOTAL SALES:

Scale is measured (or estimated in the case of forward-looking expectations) using annual net sales in billions of US dollars. Product returns and allowances and discounts are included in net sales.

Factor: Business Profile (35% weight)

Why it matters

The business profile of a protein or agriculture company greatly influences its ability to generate sustainable earnings and operating cash flows.

This factor comprises five qualitative sub-factors:

Geographic Diversification

Geographic diversity in terms of sales and the supply of raw materials is important because it reduces a company's exposure to adverse regional or vendor-specific developments that could cause supply disruptions, demand shifts and price fluctuations. The benefits of diversification are typically more apparent when end markets are unstable.

Segment Diversification

A diversified mix of products, especially for which demand and supply dynamics are uncorrelated, helps a company withstand shocks in one segment and sustain its overall sales and profitability.

Market Share

The sustainability and strength of a company's market share provide important indications of its pricing power. The reputational benefit of being a market leader often allows a company to charge a premium for perceived higher quality, even in the case of commodity products. In some instances, protein companies with a large market share are better able to adjust production volumes to help balance global supply and demand, which can support their profitability.

Changes in market share over time are an important indicator of the sustainability of a company's market position.

Product Portfolio Profile

Companies that add higher value to their products through processing, innovation and differentiation typically have stronger and more stable earnings and cash flow, if quality is maintained over time. Innovation capacity is another important indicator of the strength of a company's product portfolio, because a company that introduces successful new products or that can quickly follow innovative product trends led by competitors is better able to sustain demand for its products.

Products with strong, reputable brand names generally have greater pricing power because consumers typically perceive them as having more value than non-branded private label products.

Earnings Stability

Strong earnings stability, defined by the consistency and predictability of earnings, is a key credit strength. Earnings volatility is a defining characteristic of protein and agriculture companies, due to typically wide fluctuations in commodity prices that can have a dramatic effect on selling prices and the cost of goods sold. In addition, certain exogenous events, such as the closure of a key export market due to political considerations or animal disease, could cause profits to fall sharply before recovering when the market re-opens.

How we assess it for the scorecard

Scoring for this factor is based on five sub-factors: Geographic Diversification; Segment Diversification; Market Share; Product Portfolio Profile; and Earnings Stability. In assessing each sub-factor, we generally 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 sub-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 sub-factor score.

GEOGRAPHIC DIVERSIFICATION:

Scoring for this qualitative sub-factor is primarily based on the geographic diversity of a company's end markets and supply regions for vital raw materials.

We assess geographic diversity of sales based on the degree of sales concentration in key markets and the stability of these markets, ranging from low sales concentration among key markets that are large, stable and mature, to very high sales concentration in small, unstable or emerging markets. In this context, we generally define markets as regions, countries or a group of countries based on their maturity. Companies that are exposed to a larger number of end markets, particularly large, stable and mature end markets, typically receive higher scores for this sub-factor.

We also assess geographic diversity based on the level of geographic concentration of key raw material supplies. Companies that rely on supplies from a limited geographic region are more exposed to risk related to the weather or livestock diseases than those that can obtain raw materials from a variety of regions within a large geographic area, including from separate regions of a large country.

SEGMENT DIVERSIFICATION:

Scoring for this qualitative sub-factor is primarily based on the number of a company's core product segments as well as their contribution to sales and profitability.

We assess segment diversity typically based on the number and mix of core product segments. A company with the strongest segment diversification would have eight or more core product segments that are each profitable and roughly the same size. A company with the weakest segment diversification would have one core segment that is not consistently profitable. In general, we consider a product or group of products to be a core product segment if it is expected to generate operating profit that does not closely track operating profit for any other product segment and represents at least 10% of total sales. Our view of what constitutes a product segment may be more narrowly or more broadly defined than what may be publicly reported by a company.

MARKET SHARE:

Scoring for this qualitative sub-factor is primarily based on a company's market shares in different markets and segments as well as the relative market shares compared to close competitors.

Companies that compete globally (i.e., they sell products in domestic and international markets) tend to have leading and substantially higher market shares than their peers and typically receive higher scores for this sub-factor. Conversely, a regional player that is not a market leader in its key segments or has market shares very close to peers' typically receives a lower score for this sub-factor. A key segment for a company is a segment that we view as strategically important, both in terms of market penetration and profitability.

PRODUCT PORTFOLIO PROFILE:

Scoring for this qualitative sub-factor is primarily based on key characteristics of the company's portfolio of products and product categories, such as the mix of value-added and commodity-like products, brand strength and the innovation capacity of product categories.

Value-added products typically require a degree of raw material processing or proprietary capability to make or deliver to customers. A company that produces mostly lower value-added products that are susceptible to commodity cycles typically receive lower scores for this sub-factor.

We may also consider whether a company adds value to commodity products through its attention to, and reputation for, food safety, distribution capabilities, high service levels or operating efficiency.

In assessing innovation capacity, we may consider the percentage of total sales represented by new products (i.e., products introduced in the past few years). Our assessment of value-added products also typically considers where a product or group of products is in its life cycle, i.e., how long the product or group of products has been on the market.

Very strong operating profitability of some segments, i.e., above 10%, can also indicate that a company has a strong portfolio of value-added products. However, lower operating profitability is not necessarily indicative of weakness in the product portfolio profile.

EARNINGS STABILITY:

Scoring for this qualitative sub-factor is primarily based on the stability and predictability of operating profits, including the potential for sharp, short-term earnings declines, and the length of time to return to stability. Our assessment incorporates our view of operating efficiency or supply discipline as indicators of future volatility. A company that demonstrates very poor operating efficiency or a lack of supply discipline would typically receive a lower score for this sub-factor.

We also consider whether a company typically exhibits operating losses during cyclical downturns and whether the losses are persistent and large, as well as the materiality and timing of recovery. Companies that have a strong track record of low volatility in operating profit during cyclical downturns that is likely to continue in subsequent downturns typically receive higher scores for this sub-factor.

Conversely, a company that is susceptible to large, persistent losses during cyclical downturns and lengthy recovery times typically scores lower for this sub-factor.

Factor: Leverage and Coverage (40% weight)

Why it matters

Leverage and cash flow coverage measures provide important indications of a protein or agriculture company's financial flexibility and long-term viability. Financial flexibility is critical to protein and agriculture companies because it indicates an ability to withstand commodity price volatility or product oversupply conditions.

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.

CFO / Debt

The ratio of cash flow from operations to debt (CFO/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 in relation to total debt .

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 also provides an indication of management's risk tolerance and a reference point for comparing the capital structures of companies within the industry.

EBITA / Interest Expense

The ratio of earnings before interest, taxes and amortization to interest expense (EBITA/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; CFO/Debt; Debt/Book Capitalization; and EBITA/Interest Expense.

DEBT / EBITDA:

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

CFO / DEBT:

This numerator is cash flow from operations, and the denominator is total debt.

DEBT / BOOK CAPITALIZATION:

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

EBITA / INTEREST EXPENSE:

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

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 for 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[3] 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 include 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 protein and agriculture 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 an issuer 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 an issuer's business profile. 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 protein and agriculture sector. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[4]

In the protein and agriculture sector, environmental risks are typically higher in developing countries where unsustainable farming methods, including deforestation, may result in negative developments such as short-term overproduction, air and water pollution, soil erosion, volatile weather conditions and increased regulation. Because of their greater impact on air or water pollution, some sub-sectors in the industry, such as commercial animal farming, have greater risk of being forced by local regulators or authorities to depollute production sites.

Some protein and agriculture companies, including palm oil growers and aquaculture businesses, depend on water availability to maintain stable production levels. Water dependency poses operational risk if water shortages lead to rationalization of water usage away from these industries. Shifts in environmental regulations may also increase the costs of production. For example, local legislation mandating the use of biofuel in gasoline can increase demand for corn and contribute to rising corn prices, a key raw material in animal feed.

Protein and agriculture companies typically pass through rising feed costs to the consumer, which raises the risk that consumers will change their eating habits and switch from one animal-based protein to another. In more mature markets, increasing consumer focus on health and wellness, sustainability and environmental concerns may also support the move toward plant-based proteins and meatless meals. Import restrictions such as tariffs and measures to limit the spread of pathogens can also negatively affect sales for protein and agriculture companies.

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 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.

Liquidity

Liquidity is an important rating consideration for all protein and agriculture 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.[5]

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 protein and agriculture 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.[6] 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.[7] 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 protein and agriculture sector if it is owned by a highly rated owner(s) and is viewed to be of strategic importance to those owners. This may be the case even in the absence of a parent guarantee. 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 places 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.[8] 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 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.

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,[9] 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,[10] 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[11] 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.[12]

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.[13]

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.[14]

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[15]

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.[16] 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.

Appendix: Adjustments to agricultural cooperatives' financial statements

In this appendix, we describe our adjustments to agricultural cooperatives' financial statements. The calculation of credit metrics used for assessing an agricultural cooperative's creditworthiness may require adjustments to numbers reported under Generally Accepted Accounting Principles (GAAP). These adjustments are specific to cooperatives, which have unique accounting practices under GAAP, and the adjustments reflect certain cost-flexibility characteristics common to some cooperatives. In addition, cooperatives may use different accounting methods to report earnings.

We make two general analytic adjustments.

Classify payments for produce made to members as cost of goods sold

The differences in the way cooperatives report payments to members for produce under GAAP can distort actual earnings and make financial comparisons challenging. We typically make adjustments to the financial metrics to include in cost of goods sold (COGS) the amount of cash payments made to members for produce. Many cooperatives report this amount publicly; in cases where it is not reported publicly, we typically estimate these cash payments by applying average market prices for the underlying commodities to reported or estimated volume data.

Reduce adjusted COGS by the estimated discretionary component of total member payments

We add back to gross margin (by reducing COGS) a portion of total member distributions (produce payments, retirement of equities and patronage payments), to reflect the partially discretionary nature of these member distributions. The amount of the add-back is based partly on our estimation of the amount of economic profit generated by the cooperative and the ability and willingness of the cooperative to retain such payments.

The amount of cooperative member payments represents whatever is expected to remain after all operating and financing costs are paid, less a minimal amount retained by the cooperative to boost equity. The cash payments to members for produce can often be higher than the price at which the produce would typically sell, because the business model of agricultural cooperatives emphasizes the maximization of cash payments to members for their produce over profit generation. Thus, payments to members for produce can include amounts that a non-cooperative might deliver to shareholders, based on earnings, in the form of dividends or share repurchases.

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

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

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

6 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.

7 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.

8 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.

9 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.

10 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.

11 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.

12 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.

13 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.

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

15 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 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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