

RATING METHODOLOGY

22 December 2021

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Rating Methodology

Packaging Manufacturers: Metal, Glass and Plastic Containers

This rating methodology replaces the *Packaging Manufacturers: Metal, Glass and Plastic Containers Methodology* published in September 2020. 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 manufacture and sale of metal, glass and plastic packaging to companies in a wide variety of sectors, including food and beverage; personal care; retail; home care, such as cleaning supplies; pharmaceutical and medical sectors.

Companies that are primarily engaged in using paper as the main manufacturing material in packaging are rated under our methodology for paper and forest products.¹ Companies that are primarily engaged in the production and sale of consumer packaged goods are rated under our methodology for consumer packaged goods.²

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

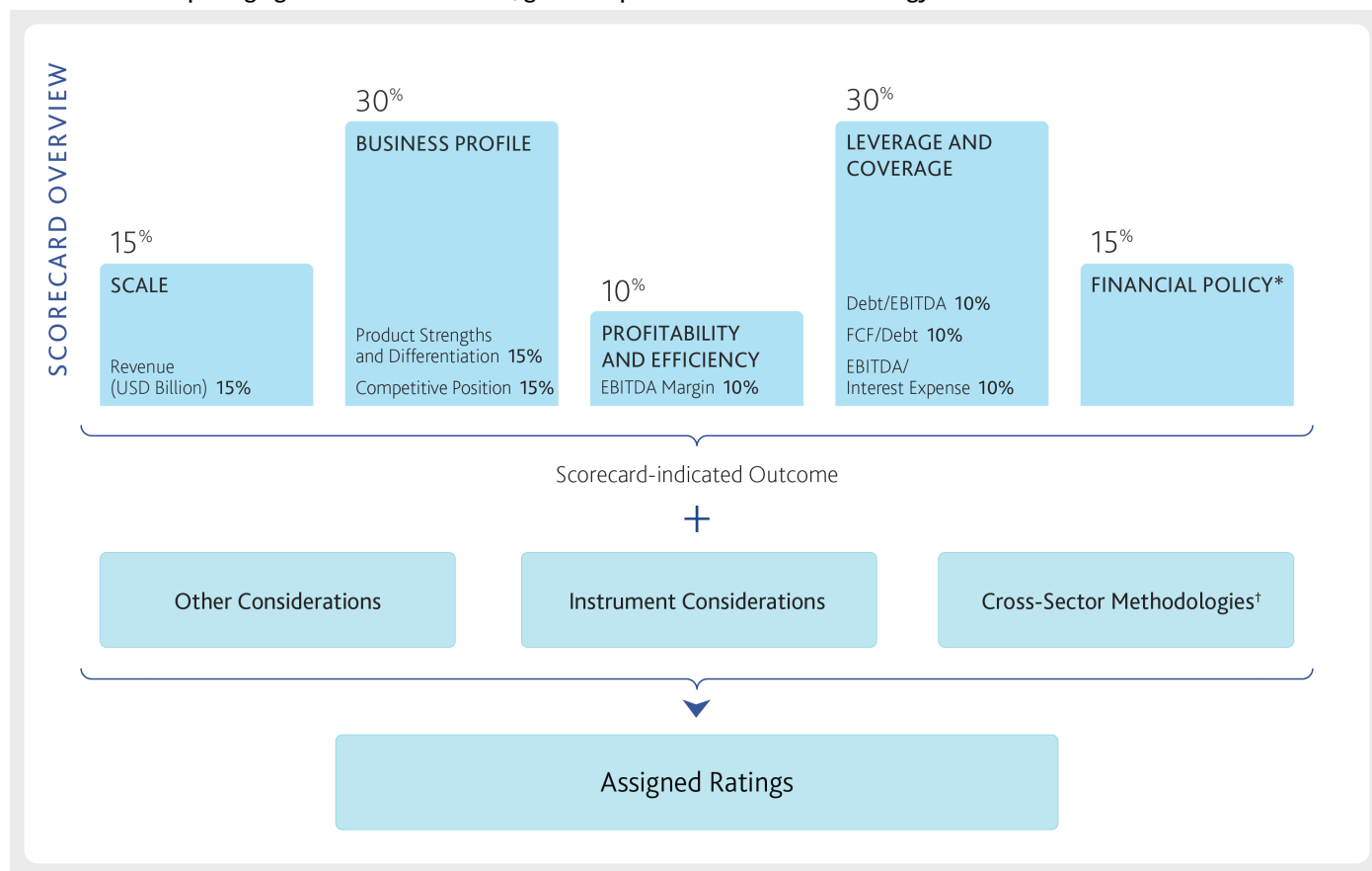
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the packaging manufacturers: metal, glass and plastic containers 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 packaging manufacturers: metal, glass and plastic containers, which includes the use of a scorecard.³ The scorecard-indicated outcome is not expected to match the actual rating for each company. For more information, see the "Other considerations" and "Limitations" sections.

Exhibit 1

Illustration of the packaging manufacturers: metals, glass and plastic containers 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

Packaging manufacturers: metals, glass and plastic containers 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

Packaging manufacturers: metals, glass and plastic containers scorecard

SCALE (15%)		BUSINESS PROFILE (30%)		PROFITABILITY and EFFICIENCY (10%)	LEVERAGE and COVERAGE (30%)		FINANCIAL POLICY (15%)	
Revenue (USD Billion) ^[1] (15%)	Product Strengths and Differentiation (15%)	Competitive Position (15%)	EBITDA Margin ^[2] (10%)	Debt / EBITDA ^[3] (10%)	FCF / Debt ^[4] (10%)	EBITDA / Interest Expense ^[5] (10%)	Financial Policy (15%)	
Aaa	≥ \$60	100% of business from custom products, unique processes and proprietary technology that are not replicable by other manufacturers; leading, very well-known brands and history of innovation and execution; well-diversified product line and balanced global footprint.	Extremely well-entrenched with all customers, including at onsite facilities; very high extent of shared R&D cost with customers; very high proportion of product set and revenue from products with regulatory approvals (e.g., FDA); very high proportion of patented products; all business is under long-term contracts with well-structured, immediate pass-through provisions for all input costs; unparalleled market leader with significant pricing power; and extremely few alternative suppliers.	≥ 70%	≤ 0.5x	≥ 25%	≥ 30x	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 very strong credit profile over the long term.
Aa	\$35 - \$60	Very high proportion of business from custom products, unique processes and proprietary technology; leading, very well-known brands and history of innovation and execution; well-diversified product line and balanced global footprint.	Very well-entrenched with all customers, including at onsite facilities; very high extent of shared R&D costs with customers; very high proportion of product set and revenue from products with regulatory approvals (e.g., FDA); very high proportion of patented products; substantially all business is under long-term contracts with well-structured pass-through provisions for all input costs, with lags of less than 15 days; strong market leader with significant pricing power; and very few alternative suppliers.	55% - 70%	0.5x - 1.5x	20% - 25%	18 - 30x	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 strong credit profile over the long term.
A	\$15 - \$35	High proportion of business from custom products, unique processes and proprietary technology; leading, very well-known brands and history of innovation and execution; diversified product line with a global footprint.	Well-entrenched with high proportion of customers, including at onsite facilities; high extent of shared R&D costs with customers; high proportion of product set and revenue from products with regulatory approvals (e.g., FDA); high proportion of patented products; substantially all business is under long-term contracts with well-structured cost pass-through provisions for all costs with lags of no more than 30 days; market leader with significant pricing power; and few alternative suppliers.	40% - 55%	1.5x - 2.5x	15% - 20%	10 - 18x	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 (15%)		BUSINESS PROFILE (30%)		PROFITABILITY and EFFICIENCY (10%)	LEVERAGE and COVERAGE (30%)			FINANCIAL POLICY (15%)
Revenue (USD Billion) ^[1] (15%)	Product Strengths and Differentiation (15%)	Competitive Position (15%)	EBITDA Margin ^[2] (10%)	Debt / EBITDA ^[3] (10%)	FCF / Debt ^[4] (10%)	EBITDA / Interest Expense ^[5] (10%)	Financial Policy (15%)	
Baa	\$5 - \$15	Majority of business from custom products, unique processes and proprietary technology; very well-known brands and history of innovation and execution; moderately diversified product line; global footprint or reach.	Entrenched with high proportion of customers, including at onsite facilities; high extent of shared R&D costs with customers; high proportion of product set and revenue from products with regulatory approvals (e.g., FDA); high proportion of patented products; most business is under long-term contracts with well-structured cost pass-through provisions; market leader with meaningful pricing power; few alternative suppliers.	30% - 40%	2.5x - 3.5x	10% - 15%	6 - 10x	Expected to have financial policies (including risk and liquidity management) that balance the interest 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 proportion of business from custom products, unique processes and proprietary technology; well-known brands and history of innovation and execution; global footprint or reach.	Entrenched with majority of customers, including at onsite facilities; some R&D cost-sharing with customers; moderate proportion of product set and revenue from products with regulatory approvals (e.g., FDA); some patented products; most business under long-term contracts with cost pass-through provisions for most costs or company has some pricing power; few alternative suppliers.	20% - 30%	3.5x - 4.75x	5% - 10%	4 - 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	\$0.5 - \$1.5	Low proportion of custom products; some proprietary technology; some brand recognition; limited global footprint or reach.	Not strongly entrenched with customers; business under long-term contracts, but input cost pass-through provisions are not well-structured; not all costs are passed through, or significant lags exist in passing through costs; multiple alternative suppliers.	12% - 20%	4.75x - 6.5x	0% - 5%	2 - 4x	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.
Caa	\$0.25 - \$0.5	Almost all products are commodity-like; limited proprietary technology; limited brand recognition; limited global footprint or reach.	Customers could move substantially all business to other suppliers at relatively low cost; multiple highly competitive alternative suppliers.	5% - 12%	6.5x - 8.5x	(5)% - 0%	1 - 2x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	< \$0.25	All products are commodity-like; no brand or process recognition; limited global footprint or reach.	Essentially all business is readily substitutable or is on a purely spot market basis.	< 5%	> 8.5x	< (5)%	< 1x	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 85%. A value of 85% 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 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.

[4] For the linear scoring scale, the Aaa endpoint value is 50%. A value of 50% or better equates to a numeric score of 0.5. The Ca endpoint value is (10)%. A value of (10)% or worse equates to a numeric score of 20.5.

[5] For the linear scoring scale, the Aaa endpoint value is 80x. A value of 80x or better equates to a numeric score of 0.5. The Ca endpoint value is (1)x. A value of (1)x or worse equates to a numeric score of 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 (15% weight)

Why it matters

Scale is an important indicator of the overall depth of a company's business and its success in attracting a variety of customers, as well as its resilience to shocks, such as shifts in demand or rapid cost increases.

Larger-scale packaging manufacturers generally have greater capacity to leverage costs, including those associated with manufacturing, sales force and marketing, distribution, and research and development. They also tend to have more clout with purchasing organizations, customers and suppliers, and have greater flexibility to withstand exposure to regulatory and operational risks. A company's scale can provide insight into its market position and franchise strength.

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 (30% weight)

Why it matters

The business profile of a packaging manufacturer is important because it greatly influences its ability to generate sustainable earnings and operating cash flows and has a considerable impact on the stability of its revenue and margins.

A packaging manufacturer's business profile provides important indications of its ability to compete on a number of levels, including price, volume, production capacity, product quality and innovation. Core aspects of a packaging manufacturer's business profile are its product strengths and differentiation and its competitive position.

Product Strengths and Differentiation

Product strengths and differentiation are important because packaging manufacturers that have differentiated product offerings often have a significant advantage over competitors that have a more limited variety of products. An important aspect of product strength and differentiation is a packaging manufacturer's offering of value-added products compared with more commodity-like products. Packaging manufacturers can also differentiate their products through the use of proprietary technologies, including manufacturing and design processes that are not easily reproduced by competitors, or through the development and maintenance of well-known brands. Companies that derive a greater portion of their business from value-added products and processes are generally better able to raise prices.

A history of innovation and execution is a key attribute in differentiating among packaging manufacturers. The capacity to innovate is important because it may support a company's ability to respond more readily to shifts in demand, including those brought about by changes in consumer preferences or regulation. Packaging containers can move rapidly from being premium, value-added items to commodity-like products. A well-diversified product line is another way a packaging company can limit volatility of revenue resulting from shifts in demand.

The extent of a packaging manufacturer's global footprint or reach is important because a presence in a region experiencing favorable trends may help mitigate the effects of economic or other weaknesses in another region.

Competitive Position

A packaging manufacturer's competitive position is directly related to the ease with which its customers can switch packaging suppliers. Close relationships between packaging manufacturers and customers may mean higher costs for customers if they choose to switch business to competing suppliers, and higher costs may serve as a potential deterrent to switching. The nature of the relationship between the packaging manufacturer and its customer is important because it provides important indications of the soundness of a company's product pipeline, recurring demand for its products and its ability to leverage fixed costs.

Packaging manufacturers can entrench themselves with customers with on-site manufacturing, shared research and development costs or long-term supply contracts. Packaging companies that have obtained regulatory approvals, including from the US Food and Drug Administration, for complex and expensive regulatory or customer approval processes or that sell patented products are also better entrenched with customers. In these customer relationships, switching to other packaging manufacturers, which may lack such regulatory approvals or be unable to provide comparable products, may not be a viable option. For packaging manufacturers that are not strongly entrenched, customers could move substantially all business to other packaging suppliers at relatively low costs.

Packaging manufacturers' contracts are important indicators of their competitive position. Long-term contracts containing provisions that allow companies to promptly recoup a rise in input costs help maintain stable cash flow. A company's pricing power is also an indicator of its ability to compete in the market.

Markets with few alternative suppliers also help increase switching costs for customers because of the limited competition and help ensure a steady revenue stream for packaging companies.

How we assess it for the scorecard

Scoring for this factor is based on two sub-factors: Product Strengths and Differentiation; and Competitive Position.

PRODUCT STRENGTHS AND DIFFERENTIATION:

In assessing product strengths and differentiation, we consider a packaging manufacturer's business from custom products, unique processes and proprietary technology that are not easily reproducible by other manufacturers. Companies that derive a greater portion of their business from such products and processes are typically better positioned for this sub-factor than companies that lack such processes and whose product line consists mostly of commodity-type products.

We also consider the diversity and strength of a packaging manufacturer's brands and its history of innovation and execution. Companies with leading, well-known brands and a history of innovation and execution are typically better positioned for this sub-factor than packaging manufacturers that have a limited number of brands and little history of innovation and execution.

Additionally, packaging manufacturers that have a broad global footprint are typically stronger for this sub-factor than companies whose geographic footprint or business reach is limited.

COMPETITIVE POSITION:

In assessing competitive position and switching costs, we consider the extent that a packaging manufacturer is entrenched with its customers. Companies that have on-site facilities with customers, share a significant portion of research and development costs with customers and have regulatory approvals for packaging content and processes or a high proportion of patented products are generally better positioned for this sub-factor score than packaging manufacturers that lack such characteristics.

We also consider the proportion of packaging manufacturers' long-term contracts that allow manufacturing costs to be recouped immediately, compared with the lack of such contracts and provisions. Companies with a greater portion of long-term contracts with well-structured cost pass-through provisions are typically better positioned than companies that lack such contracts and provisions.

Packaging manufacturers with strong pricing power generally score higher for this sub-factor than companies whose pricing power is limited.

In our assessment of competitive position and switching costs, we consider the number of alternative packaging suppliers in a given market. Packaging manufacturers that operate in markets with fewer alternative suppliers generally score higher on this sub-factor score than companies in markets where multiple alternative packaging manufacturers exist.

Factor: Profitability and Efficiency (10% weight)

Why it matters

Profits matter because they are needed to generate sustainable cash flow and maintain a competitive position, which includes an ability to invest in marketing, research, factories and personnel. High profitability sustained over time is generally an indicator of operating efficiency and competitive advantage.

Profitability provides an important indication of a company's cost structure and its ability to operate through economic downturns, reinvest in fixed assets, service its debt and meet other obligations.

How we assess it for the scorecard

EBITDA MARGIN:

We use the ratio of earnings before interest, taxes, depreciation and amortization to revenue (EBITDA/Revenue).

Factor: Leverage and Coverage (30% weight)

Why it matters

Leverage and cash flow coverage measures provide important indications of a company's financial flexibility and long-term viability, including its ability to adapt to changes in consumer preferences, regulation and the competitive environment.

Companies in this sector have typically supported their borrowing needs by relying on sizable fixed assets as collateral and significant revenue from long-term contracts to pay down debt.

The factor comprises three 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.

FCF / Debt

The ratio of free cash flow to debt (FCF/Debt) provides a different view of a company's ability to repay its debt, compared with Debt/EBITDA, because it compares cash flow generation after working capital movements, capital expenditures and dividends to total debt.

EBITDA / Interest Expense

The ratio of earnings before interest, taxes, depreciation and amortization to interest expense (EBITDA/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 three sub-factors: Debt/EBITDA; FCF/Debt; and EBITDA/Interest Expense.

DEBT / EBITDA:

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

FCF / DEBT:

The numerator is free cash flow, and the denominator is total debt.

EBITDA / INTEREST EXPENSE:

This numerator is EBITDA, 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 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 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 management⁴ is an important aspect of overall risk management and can provide insight into risk tolerance.

Packaging companies have historically used acquisitions to spur revenue growth, expand business lines, consolidate market positions, advance cost synergies or seek access to new technology.

How we assess it for the scorecard

We assess the issuer's desired capital structure or targeted credit profile, 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 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 packaging manufacturers 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 also play a role in our assessment of a packaging manufacturer's profitability and our assessment of its Business Profile. For instance, regulatory authorities may require a change in the raw materials used for plastics manufacturing in order to improve recyclability. These requirements can lead to additional investment and increase a company's cost of goods sold. 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 packaging manufacturer sector. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.⁵

Consumer preferences may change based on evolving perceptions of the environmental impact of packaging, which may lead to reduced demand for certain types of packaging materials or substrates. ESG considerations also play a role in our assessment of a packaging manufacturer's profitability and cash flows and our assessment of its Business Profile.

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 packaging manufacturers, 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.⁶

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.

Non-wholly Owned Subsidiaries

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

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

Event Risk

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

Parental Support

Ownership can provide ratings lift for a particular company in the packaging manufacturers 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.⁹ For example, price controls, onerous taxation and high distributions can have a negative effect on an issuer's underlying credit profile.

Other Institutional Support

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

Seasonality

Seasonality 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, cyclicity itself poses many different types of risks to companies, and cycles do not reverse themselves with predictable regularity. A cyclical sector may also be affected by a secular decline or expansion. These considerations may be incorporated qualitatively in ratings.

Using the scorecard to arrive at a scorecard-indicated outcome

1. Measurement or estimation of factors in the scorecard

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

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

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

All of the quantitative credit metrics incorporate our standard adjustments¹² 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	$x \leq 1.5$
Aa1	$1.5 < x \leq 2.5$
Aa2	$2.5 < x \leq 3.5$
Aa3	$3.5 < x \leq 4.5$
A1	$4.5 < x \leq 5.5$
A2	$5.5 < x \leq 6.5$
A3	$6.5 < x \leq 7.5$
Baa1	$7.5 < x \leq 8.5$
Baa2	$8.5 < x \leq 9.5$
Baa3	$9.5 < x \leq 10.5$
Ba1	$10.5 < x \leq 11.5$
Ba2	$11.5 < x \leq 12.5$
Ba3	$12.5 < x \leq 13.5$
B1	$13.5 < x \leq 14.5$
B2	$14.5 < x \leq 15.5$
B3	$15.5 < x \leq 16.5$
Caa1	$16.5 < x \leq 17.5$
Caa2	$17.5 < x \leq 18.5$
Caa3	$18.5 < x \leq 19.5$
Ca	$19.5 < x \leq 20.5$
C	$x > 20.5$

Source: Moody's Investors Service

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

In general, the scorecard-indicated outcome is oriented to the corporate family rating (CFR) for speculative-grade issuers and 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.¹³

Assigning issuer-level and instrument-level ratings

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

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

Key rating assumptions

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

Limitations

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

Limitations of the scorecard

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

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

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

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

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

General limitations of the methodology

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

Ratings reflect our expectations for an issuer's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard inputs or in other considerations, typically diminishes. Our forward-looking opinions

are based on assumptions that may prove, in hindsight, to have been incorrect. Reasons for this could include unanticipated changes in any of the following: the macroeconomic environment, general financial market conditions, industry competition, disruptive technology, or regulatory and legal actions. In any case, predicting the future is subject to substantial uncertainty.

Moody's related publications

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

For data summarizing the historical robustness and predictive power of credit ratings, please click [here](#).

For further information, please refer to *Rating Symbols and Definitions*, which is available [here](#).

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

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Endnotes

- [1](#) A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.
- [2](#) A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.
- [3](#) In our methodologies and research, the terms "scorecard" and "grid" are used interchangeably.
- [4](#) Liquidity management is distinct from the level of liquidity, which is discussed in the "Other considerations" section.
- [5](#) A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.
- [6](#) A link to a list of our cross-sector methodologies can be found in the "Moody's related publications" section of this report.
- [7](#) For example, in the case of an equity stake reduction in a subsidiary down to 75%, in the parent's financial statements, all revenue and EBITDA of the subsidiary would typically still be consolidated at the group level.
- [8](#) Proportional consolidation brings a portion of the minority subsidiary's debt onto the balance sheet, but this debt is structurally senior to debt at the parent company, because it is closer to the assets and cash flows of the minority subsidiary.
- [9](#) For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology that describes our approach for assessing government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.
- [10](#) 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.
- [11](#) For definitions of our most common ratio terms, please see *Moody's Basic Definitions for Credit Statistics (User's Guide)*. A link can be found in the "Moody's related publications" section.
- [12](#) For an explanation of our standard adjustments, please see the cross-sector methodology that describes our financial statement adjustments in the analysis of non-financial corporations.
- [13](#) A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.
- [14](#) For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.
- [15](#) A link to a list of our sector and cross-sector rating methodologies can be found in the "Moody's related publications" section.
- [16](#) A link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.
- [17](#) A link to a list of our sector and cross-sector methodologies can be found in the "Moody's related publications" section.

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