MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY
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Rating Methodology

Automotive Suppliers

This rating methodology replaces the *Automotive Supplier Methodology* published in January 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 design, production, assembly, sale and distribution of parts or services to the automotive manufacturing industry, primarily parts or services for light vehicles, passenger cars and commercial vehicles, or respective aftermarkets. Aftermarket distributors and logistics companies that are primarily engaged in the sale and distribution of auto parts to retail end markets are rated under our methodology for distribution and supply chain services.[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.

This methodology was updated on October 18, 2022. We corrected a typographical error on page 7.

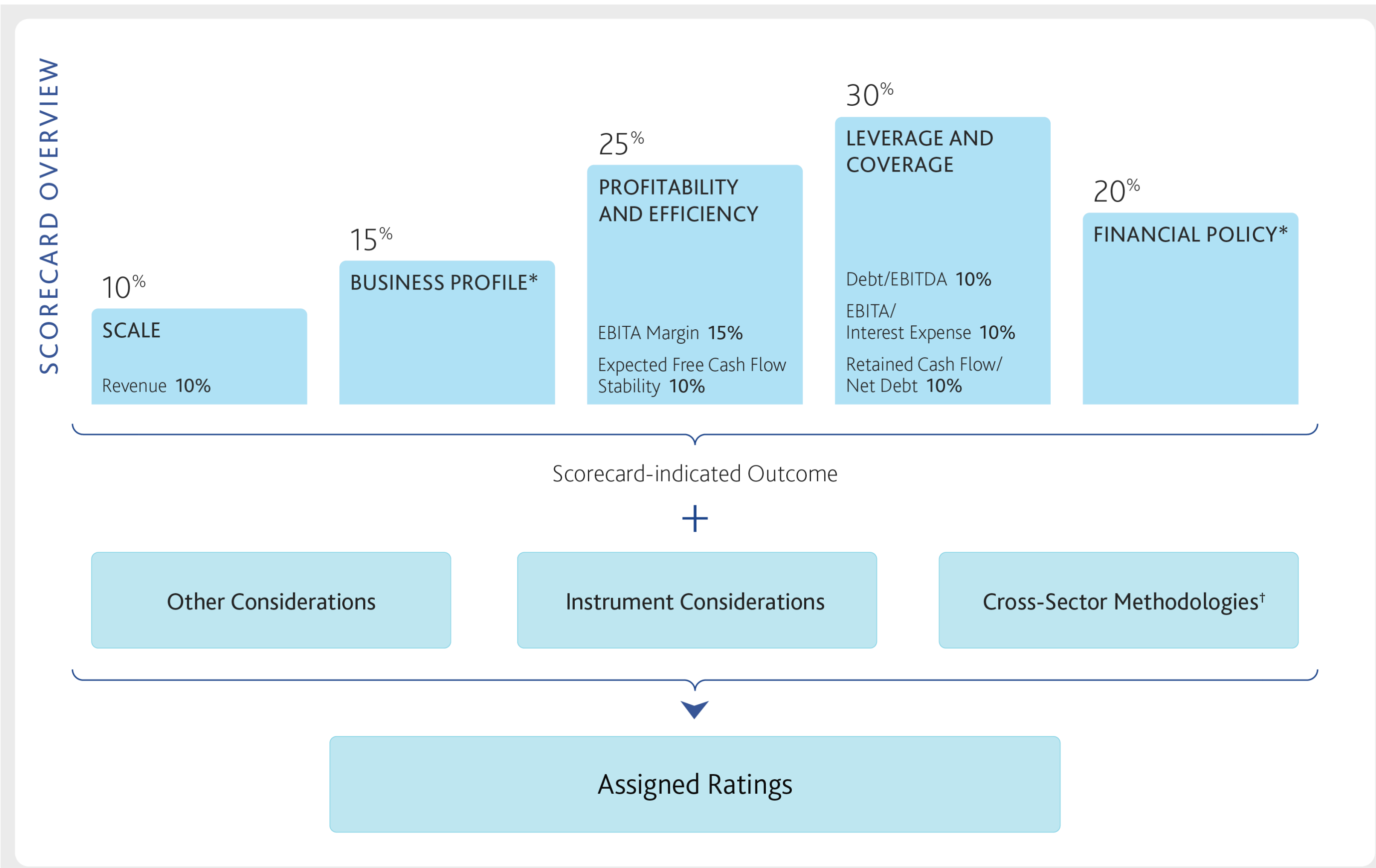
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the automotive supplier 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 automotive suppliers, 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 automotive supplier 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

Automotive supplier 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

Automotive supplier scorecard

	SCALE (10%)	BUSINESS PROFILE (15%)	PROFITABILITY and EFFICIENCY (25%)		LEVERAGE and COVERAGE (30%)			FINANCIAL POLICY (20%)
	Revenue (USD Billion)[1] (10%)	Business Profile (15%)	EBITA Margin[3] (15%)	Expected Free Cash Flow Stability (10%)	Debt / EBITDA[4] (10%)	EBITA / Interest Expense[5] (10%)	Retained Cash Flow / Net Debt[6] (10%)	Financial Policy (20%)
Aaa	≥ $75	Technological leadership[2] in areas with increasing volumes of high content per vehicle products; essentially no threat of product substitution; and extremely high barriers to entry.	≥ 25%	Expected to have consistent and extremely high positive free cash flow combined with high levels of capital investment and no deferred capital investment.	≤ 0.5x	≥ 20x	≥ 90%	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	$45 - $75	Technological leadership[2] in areas with increasing volumes of high content per vehicle products; very low threat of product substitution over the development cycle; and very high barriers to entry.	20% - 25%	Expected to have consistently high positive free cash flow combined with high levels of capital investment and no deferred capital investment.	0.5x - 1x	12x - 20x	65% - 90%	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	$16 - $45	Technological leadership[2] in areas with increasing volumes of high content per vehicle products; low threat of product substitution over the development cycle; and high barriers to entry.	15% - 20%	Expected to have consistent positive free cash flow combined with steady capital investment and no deferred capital investment.	1x - 1.5x	6x - 12x	45% - 65%	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.
Baa	$8 - $16	Technological leadership[2] in areas with increasing volumes of high content per vehicle products; moderate threat of product substitution over the development cycle; moderately high barriers to entry.	11% - 15%	Expected to have positive free cash flow in most years, except in years during which there is extraordinary capital investment for a new product, and no deferred capital investment.	1.5x - 2.5x	4.5x - 6x	25% - 45%	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.

	SCALE (10%)	BUSINESS PROFILE (15%)	PROFITABILITY and EFFICIENCY (25%)		LEVERAGE and COVERAGE (30%)			FINANCIAL POLICY (20%)
	Revenue (USD Billion)[1] (10%)	Business Profile (15%)	EBITA Margin[3] (15%)	Expected Free Cash Flow Stability (10%)	Debt / EBITDA[4] (10%)	EBITA / Interest Expense[5] (10%)	Retained Cash Flow / Net Debt[6] (10%)	Financial Policy (20%)
Ba	$4 - $8	Some commodity-type products in the portfolio; high threat of product substitution over the longer term; low barriers to entry.	8% - 11%	Expected to have varying levels of free cash flow, resulting from uneven capital investment.	2.5x - 3.5x	3x - 4.5x	15% - 25%	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 - $4	Mostly commodity-type products in the portfolio; high threat of product substitution over the development cycle; very low barriers to entry.	5% - 8%	Expected to have negative free cash flow in most years of a down cycle and may be unable to make capital investment in those years.	3.5x - 5.5x	1.5x - 3x	10% - 15%	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	$0.3 - $1	Mostly commodity-type products in the portfolio; intense threat of product substitution over the development cycle; or extremely low barriers to entry.	2% - 5%	Expected to have negative free cash flow and may be unable to make ongoing capital investments; deferred capital investment or trend of underinvestment with deteriorating market position or operating efficiency.	5.5x - 7.5x	0.5x - 1.5x	5% - 10%	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	< $0.3	Essentially no competitive differentiation; essentially no barriers to entry; or rapidly eroding competitive position.	< 2%	Expected to have negative free cash flow and company requires cash infusion over the near term to make ongoing capital investment.	> 7.5x	< 0.5x	< 5%	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.

[1] For the linear scoring scale, the Aaa endpoint value is $120 billion. A value of $120 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] Examples of technological leadership include products supporting stricter environmental emission standards, alternative propulsion, connectivity and cybersecurity, advanced safety features, or autonomous driving.
[3] For the linear scoring scale, the Aaa endpoint value is 50%. A value of 50% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% or worse equates to a numeric score of 20.5.
[4] For the linear scoring scale, the Aaa endpoint value is 0x. A value of 0x equates to a numeric score of 0.5. The Ca endpoint value is 10x. A value of 10x or worse equates to a numeric score of 20.5, as does a negative Debt/EBITDA value.
[5] For the linear scoring scale, the Aaa endpoint value is 50x. A value of 50x 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, as does negative EBITA.
[6] For the linear scoring scale, when net debt is positive, the Aaa endpoint value is 120%. A value of 120% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% or worse equates to a numeric score of 20.5. When net debt is negative and RCF is positive, the numeric score is 0.5. When net debt is negative and RCF is negative or zero, the numeric score is 20.5.
Source: Moody's Investors Service

Sector overview

High earnings volatility is a characteristic of automotive suppliers, owing to the cyclical nature of the automotive industry. Macroeconomic conditions influence consumer purchasing decisions and industry purchasing volumes, as well as the availability and cost of consumer financing. Demand may also be influenced by regulatory mandates.

Automotive suppliers make large upfront investments in research and development (R&D) to secure supply agreements with major automakers. These investments are not always fully recovered because of periodic variations in new car demand and the potential for underperformance of a given model platform. In addition, automakers typically require periodic price reductions, often referred to as price-downs, which are built into supply agreements. As such, auto suppliers are under pressure to continually reduce manufacturing costs to offset regular price reductions on automotive programs.

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 market strength and operating flexibility, as well as its resilience to shocks, such as sudden shifts in demand or rapid cost increases. Scale has a bearing on other considerations, such as geographic diversity and R&D capabilities.

Large-scale companies generally have more flexibility to manage their businesses under different demand and cost scenarios, an important consideration in an industry that is highly cyclical. They also tend to have greater bargaining strength with automakers and raw material or sub-component suppliers.

How we assess it for the scorecard

REVENUE:

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

Factor: Business Profile (15% weight)

Why it matters

The business profile of an automotive supplier is important because it greatly influences its ability to generate sustainable earnings and operating cash flow.

A core aspect of an auto supplier's business profile is its technological capability. Companies at the forefront of technological and product innovation and that have a record of successful R&D investment benefit from barriers to entry and are typically less vulnerable to competitive threats, including product substitution, than companies that are more focused on commodity-type products. For instance, the competitive risk for a supplier of an advanced fuel-efficient ignition system is generally significantly lower than for a company that produces sheet-metal stampings of automotive body parts.

Content per vehicle, which is the value of all products supplied for one specific vehicle, is an important indicator of the value of an auto supplier's products to automakers. Content per vehicle may vary from model series to model series, and even for each individual vehicle, but is usually higher for innovative auto suppliers with greater technological capabilities. Such companies are usually better able to maintain and solidify their long-term relationships with automakers by partnering with them to develop new products or vehicle designs.

How we assess it for the scorecard

We consider an automotive supplier's technological leadership in areas likely to lead to increasing volumes of high content per vehicle products. These areas include environmental emissions standards, alternative propulsion systems, connectivity and cybersecurity, advanced safety features and autonomous driving.

We typically consider the extent to which innovation and a commitment to R&D investment contribute to a company's ability to maintain or strengthen barriers to entry. We also consider the threat of product substitution in the context of the company's technological capabilities.

Companies whose product portfolios are characterized by higher current or potential technological content typically receive higher scores for this factor. For example, auto suppliers with the capacity to meet demand for new technology (e.g., stricter environmental standards, alternative propulsion systems, connectivity or cyber security) generally receive higher scores than suppliers in product segments characterized by lower technological content or higher product substitution risk.

Factor: Profitability and Efficiency (25% weight)

Why it matters

Profitability is an indicator of an automotive supplier's ability to generate stable cash flow and maintain a competitive position. In addition, profit margins provide another indication of the value of an auto supplier's products to vehicle manufacturers.

The ability to generate strong profit margins after R&D investment enables an auto supplier to make further investments in technology and broaden its leadership within the industry. Strong profit margins under all business conditions support a company's ability to sustain its cash flow, which is needed for capital reinvestment. Strong profit margins also help companies manage raw material costs, which can be volatile.

This factor comprises two sub-factors:

EBITA Margin

EBITA margin is an indicator of operating efficiency, competitive strength and management effectiveness. For auto suppliers, this metric provides a useful indication of the ability to absorb the potential impact from weakening vehicle demand or regularly imposed price reductions from vehicle manufacturers. Companies that are able to maintain strong EBITA margins across a product cycle are also more likely to be able to support business reinvestment.

Expected Free Cash Flow Stability

The stability of expected free cash flow is another important indicator of the ability to invest in a business. Free cash flow can vary considerably for an auto supplier from year to year and largely depends on product cycles (and associated capital investment) and new contract awards. Companies that can sustain strong free cash flow generation through periods of peak investment or weakening auto sales are generally better able to support reinvestment to maintain a competitive position than companies with uneven cash flow generation and rising indebtedness.

How we assess it for the scorecard

Scoring for this factor is based on two sub-factors: EBITA Margin; and Expected Free Cash Flow Stability.

EBITA MARGIN:

The numerator is earnings before interest, taxes and amortization (EBITA), and the denominator is revenue.

In assessing this sub-factor, we typically consider whether unusual expenses reoccur. For a company that has a single restructuring event that results in a special charge, we may calculate or estimate its EBITA margin before restructuring charges in order to assess the underlying trend in the company's ongoing operations. However, in the case of a company that has annual restructuring charges, we may consider such charges ongoing costs and include them in our calculation or estimation of this metric. Because of the ongoing need to offset rising raw material costs and negotiated price reductions with automakers, restructuring expenses are typically included in EBITA.

EXPECTED FREE CASH FLOW STABILITY:

In assessing this sub-factor, we consider the strength and stability of an auto supplier's expected free cash flow. We also consider the level and consistency of capital investment.

For example, a company that has won supply agreements for several new vehicle platforms may experience weaker free cash flow for a year or two while it is making the fixed asset and working capital investments needed to execute on the new awards. As another example, an auto supplier that invests in its business to meet increased demand for new technologies or to satisfy evolving environmental standards may generate weaker free cash flow before gaining the operating efficiencies to meaningfully improve free cash flow. Conversely, an auto supplier that focuses on an established portfolio of supply contracts with comparatively less investment in new business development may demonstrate exceedingly strong free cash flow during years of peak auto production but may be placing future cash flow generation at risk if such underinvestment persists.

A company's expected free cash flow performance in the context of a business cycle is also typically important. Free cash flow can temporarily be supplemented by incrementally extending the useful life of property plant and equipment and deferring capital investment. As the business environment rebounds, however, additional investment in the business is typically required to meet the demands of platform launches and support increasing sales volumes.

Factor: Leverage and Coverage (30% weight)

Why it matters

Leverage and coverage measures provide important indications of financial flexibility and how much financial risk an automotive supplier is willing to undertake. Financial flexibility is critical to an auto supplier's ability to invest in R&D as well as to make strategic acquisitions both to acquire critical technology and expand vehicle programs to meet new platform launches.

This factor comprises three 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.

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.

RCF / Net Debt

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

How we assess it for the scorecard

Scoring for this factor is based on three sub-factors: Debt/EBITDA; EBITA/Interest Expense; and RCF/Net Debt.

DEBT / EBITDA:

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

EBITA / INTEREST EXPENSE:

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

RCF / NET DEBT:

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

Factor: Financial Policy (20% weight)

Why it matters

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

Financial risk tolerance serves as a guidepost to investment and capital allocation. An expectation that management will be committed to sustaining an improved credit profile is often necessary to support an upgrade. For example, we may not upgrade the ratings of a company that has built flexibility within its rating category if we believe the company will use that flexibility to fund a strategic acquisition, cash distribution to shareholders, spin-off or other leveraging transaction. Conversely, a company's credit rating may be better able to withstand a moderate leveraging event if management places a high priority on returning credit metrics to pretransaction 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.

Many auto suppliers have historically used acquisitions or have invested heavily in R&D to spur revenue growth, expand business lines, consolidate market positions, advance cost synergies or seek access to new technology. The financing of such investments is often an important indicator for a company's financial policy.

How we assess it for the scorecard

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

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

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

Other considerations

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

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

Regulatory Considerations

Companies in the automotive supplier 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. For example, changing regulatory frameworks for safety standards, autonomous driving or environmental standards may have a material negative impact on the demand for products which do not comply with changed regulatory requirements and might require substantial spending for new product development. 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 automotive supplier sector. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[4]

Increasing environmental requirements and efforts to reduce greenhouse gas emissions (known as carbon transition risk) may lead to higher costs for many industries. While demand for electric and hybrid vehicles presents a revenue opportunity, certain automotive supplier companies may face significant pressure to accelerate investment in carbon-curbing emissions technology or alternative propulsion technology (e.g., for use in hybrid or electric car manufacturing), which may weaken their free cash flow and financial flexibility.

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 certain leverage and coverage ratios with total (or gross) 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. In cases where we believe that cash on the balance sheet does not confer meaningful credit support, we are more likely to cite gross debt ratios in our credit analysis, press releases and rating threshold levels.

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 automotive supplier 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 auto supplier 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 automotive supplier 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. In some cases where minority interest dividends are material, we may find that an additional view of financial results, such as proportional consolidation, is useful to augment our analysis of consolidated financials. In other such cases, we may consider the risks associated with the minority holding, such as leverage at the operating company and uncertainty associated with the dividend stream, on a purely qualitative basis. 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, litigation, asset sales, spin-offs, pandemics, significant cyber-crime events and shareholder distributions.

Parental Support

Ownership can provide ratings lift for a particular company in the automotive supplier 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.[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 including the automotive supplier industry 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 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.

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, 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, 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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