

RATING METHODOLOGY

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Rating Methodology

Independent Exploration and Production

This methodology is no longer in effect. For more information on rating methodologies used by Moody's Investor Services, visit <https://ratings.moodys.com/rating-methodologies>.

This rating methodology replaces the *Independent Exploration and Production Industry* methodology published in May 2017. We have reordered and have made editorial updates to various sections of the methodology, and we have changed the presentation of the scorecard. We have removed outdated information. These updates do not change our methodological approach.

Scope

This methodology applies to companies globally that are primarily* engaged in the acquisition and development of hydrocarbon resources. The primary assets of an exploration and production (E&P) company are its oil and gas reserves below the surface that have not yet been produced and are economically viable to extract. The business requires constant reinvestment – an E&P company that does not replace the oil and gas produced each year through ongoing drilling and development capital expenditures is effectively liquidating.

Outside of North America, almost all of the world's oil and natural gas resources are owned or controlled by state-owned national oil companies.

Integrated oil and gas companies, midstream companies, and refining and marketing companies are covered under other sector methodologies.¹

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

This methodology was updated on August 31, 2021. We removed some redundant text in the 'Other considerations' section on page 10.

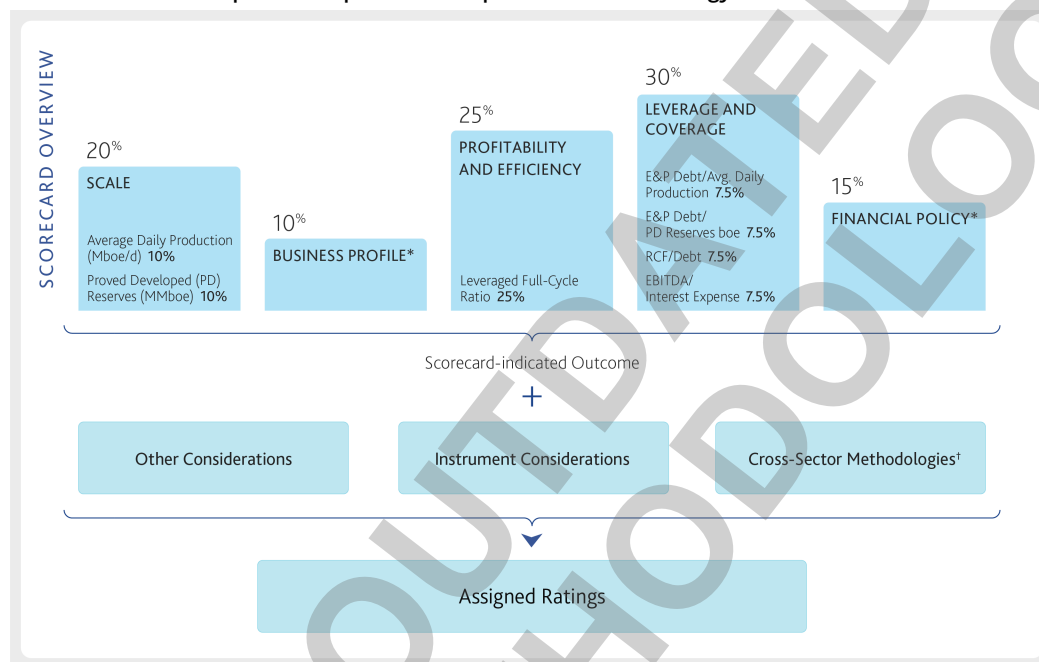
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the independent exploration and production 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 independent exploration and production companies, which includes the use of a scorecard.² The scorecard-indicated outcome is not expected to match the actual rating for each company. For more information, see the "Other considerations" and "Limitations" sections.

Exhibit 1

Illustration of the independent exploration and production methodology framework



Note: Boe stands for barrels-of-oil equivalent. Natural gas is converted to oil-equivalent basis at six thousand cubic feet per one barrel. Mboe/d is thousands of boe per day. MMboe is millions of boe.

* 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

Independent exploration and production 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

Independent exploration and production scorecard

	SCALE (20%)		BUSINESS PROFILE (10%)	PROFITABILITY and EFFICIENCY (25%)	LEVERAGE and COVERAGE (30%)			FINANCIAL POLICY (15%)	
	Average Daily Production (Mboe/d) ^[1] (10%)	Proved Developed Reserves (MMboe) ^[2] (10%)	Business Profile – Please see footnote ^[3] related to scoring (10%)	Leveraged Full- Cycle Ratio ^[4] (25%)	E&P Debt / Average Daily Production ^[5] (7.5%)	E&P Debt / PD Reserves boe ^[6] (7.5%)	RCF / Debt ^[7] (7.5%)	EBITDA / Interest Expense ^[8] (7.5%)	Financial Policy (15%)
Aaa	≥ 2750	≥ 8000	Extremely large and diversified hydrocarbon resource base; superior project execution capabilities underpinned by technological leadership.	≥ 5x	≤ \$4000	≤ \$1	≥ 100%	≥ 35x	Expected to have extremely conservative financial policies (including risk and liquidity management); very stable metrics; public commitment to very strong credit profile over the long term.
Aa	1100 - 2750	4000 - 8000	Very large and diversified hydrocarbon resource base; very strong project and resource development execution capabilities underpinned by technological leadership.	3.5x - 5x	\$4000 - \$8000	\$1 - \$2	75% - 100%	25x - 35x	Expected to have very stable and conservative financial policies (including risk and liquidity management); stable metrics; minimal event risk that would cause a rating transition; public commitment to strong credit profile over the long term.
A	550 - 1100	1500 - 4000	Large and diversified hydrocarbon resource base; strong project and resource development execution capabilities underpinned by technological leadership.	2.75x - 3.5x	\$8000 - \$12000	\$2 - \$4	50% - 75%	15x - 25x	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	140 - 550	300 - 1500	Sizeable hydrocarbon resource base albeit with some geographic/ resource type concentration; high operational control with good project execution capabilities on longer and shorter cycle investments.	2x - 2.75x	\$12000 - \$18000	\$4 - \$6	30% - 50%	10x - 15x	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	55 - 140	100 - 300	Moderate hydrocarbon resource base with limited geographic/ resource type diversification; with substantial operational control focused primarily on shorter cycle investments.	1.5x - 2x	\$18000 - \$23000	\$6 - \$8	20% - 30%	6x - 10x	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	20 - 55	25 - 100	Small hydrocarbon resource base lacking geographic/ resource type diversification; with meaningful operational control.	1x - 1.5x	\$23000 - \$29000	\$8 - \$11	10% - 20%	2.5x - 6x	Expected to have financial policies (including risk and liquidity management) that favor shareholders over creditors; high financial risk resulting from shareholder distributions, acquisitions or other significant capital structure changes.

	SCALE (20%)		BUSINESS PROFILE (10%)	PROFITABILITY and EFFICIENCY (25%)	LEVERAGE and COVERAGE (30%)			FINANCIAL POLICY (15%)	
	Average Daily Production (Mboe/d) ^[1] (10%)	Proved Developed Reserves (MMboe) ^[2] (10%)	Business Profile – Please see footnote ^[3] related to scoring (10%)	Leveraged Full- Cycle Ratio ^[4] (25%)	E&P Debt / Average Daily Production ^[5] (7.5%)	E&P Debt / PD Reserves boe ^[6] (7.5%)	RCF / Debt ^[7] (7.5%)	EBITDA / Interest Expense ^[8] (7.5%)	Financial Policy (15%)
Caa	10 - 20	10 - 25	Very small hydrocarbon resource base concentrated in single region/ resource type; with limited operator responsibilities or operational track record.	0.5x - 1x	\$29000 - \$35000	\$11 - \$14	5% - 10%	1x - 2.5x	Expected to have financial policies (including risk and liquidity management) that create a material risk of debt restructuring in varied economic environments.
Ca	5 - 10	5 - 10	Very small hydrocarbon resource base concentrated in single region/ resource type; with largely non-producing assets or no operator responsibilities.	0.25x - 0.5x	\$35000 - \$41000	\$14 - \$17	2.5% - 5%	0.25x - 1x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.
C	< 5	< 5	Extremely small hydrocarbon resource base concentrated in single region/ resource type; with almost all non-producing assets or no operator responsibilities.	< 0.25x	> \$41000	> \$17	< 2.5%	< 0.25x	Expected to have financial policies (including risk and liquidity management) that create imminent risk of debt restructuring.

[1] For the linear scoring scale, the Aaa end point value is 5,000 MBoe/d. A value of 5,000 MBoe/d or better equates to a numerical score of 0.5. The C end point value is 0. A value of 0 equates to a numerical score of 21.5. boe stands for barrels-of-oil equivalent. Natural gas is converted to oil-equivalent basis at six thousand cubic feet per one barrel. Mboe/d is thousands boe per day.

[2] For the linear scoring scale, the Aaa end point value is 12,000 MMboe. A value of 12,000 MMboe or better equates to a numerical score of 0.5. The C end point value is 0. A value of 0 equates to a numerical score of 21.5. MMboe is millions boe.

[3] For issuers with Business Profile scores in the Aa-B range, the existence of other business(es) that add diversification may result in a final score for the Business Profile one category higher than the score indicated by the E&P business alone, depending on the profile and magnitude of those businesses and their contribution to greater cash flow stability.

[4] For the linear scoring scale, the Aaa end point value is 7x. A value of 7x or better equates to a numerical score of 0.5. The C end point value is -1x. A value of -1x or worse equates to a numerical score of 21.5. The Leveraged Full-Cycle Ratio equals [realized price per boe production (reflects basis differentials, transportation and hedging) minus operating costs per boe minus total G&A costs (including capitalized portion) per boe minus total interest expense (including capitalized portion per boe)] divided by three year average all sources per boe F&D costs.

[5] For the linear scoring scale, the Aaa end point value is \$0 and equates to a numerical score of 0.5. The C end point value is \$50,000. A value of \$50,000 or worse equates to a numerical score of 21.5.

[6] For the linear scoring scale, the Aaa end point value is \$0 and equates to a numerical score of 0.5. The C end point value is \$20. A value of \$20 or worse equates to a numerical score of 21.5.

[7] For the linear scoring scale, the Aaa end point value is 140%. A value of 140% or better equates to a numerical score of 0.5. The C end point value is -10%. A value of -10% or worse equates to a numerical score of 21.5.

[8] For the linear scoring scale, the Aaa end point value is 45x. A value of 45x or better equates to a numerical score of 0.5. The C end point value is -1x. A value of -1x or worse equates to a numerical score of 21.5.

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 (20% weight)

Why it matters

Larger E&P companies benefit from greater asset diversification, financial resources and liquidity, and economies of scale. They can withstand shocks or downturns better than smaller firms. Size also tends to strongly correlate with other positive characteristics such as operating success, longevity, and diversification. Larger E&P companies generally operate in a broader range of geographic areas and geologic basins and benefit from a more diversified production mix.

Average Daily Production

Production is the principal source of current cash flow, so assessing a company's production and sources of projected growth is essential to judging credit risk. As with reserves, large production is a distinguishing characteristic for E&P companies. They typically have a mature and diversified base of stable cash generating fields that underpins drilling programs and capital investment.

Proved Developed Reserves

Proved reserves are important because they represent a store of current and future extractable value. We focus primarily on proved developed reserves, consistent with industry lending standards and best practices in evaluating debt protection (as opposed to equity valuation, which focuses on upside growth potential as indicated by broader resource measures).

Total proved reserves comprise proved developed (PD) and proved undeveloped reserves (PUD). PD reserves are the source of oil and natural gas production and cash flow, and require modest or no capital investment. PUD reserves require significant capital spending in order to convert them to PD reserves. While both classes of reserve are important for credit analysis, in our methodology we focus on PD reserves to measure scale for E&P companies since that classification is tied more directly to current cash flow generation capacity readily available for debt service. Also, unconventional resource development (i.e. shale) has resulted in a somewhat wider disparity and subjectivity in the quantification of PUDs.

How we assess it for the scorecard

Scale is measured (or estimated in the case of forward-looking expectations) using average daily production and proved developed reserves. Accounting differences and changes in commodity prices can reduce comparability and create volatility in more traditional financial metrics, such as assets and revenue, so we focus on reserves and production as more stable measures of size for E&P companies.

AVERAGE DAILY PRODUCTION:

Production data is typically obtained via regular reporting of revenues and volumes in company financial statements. Companies often project production out three to five years with some degree of visibility based on current development projects and identified discoveries.

Most companies report net production (production after royalties are paid), but some companies, particularly in Canada, report gross production (production before royalties). Because production volumes associated with royalties do not affect an E&P company's financial performance, we calculate production metrics on a net basis. In contrast to production, reserves are generally reported on a net basis, which is what we use for our calculations.

PROVED DEVELOPED RESERVES:

We obtain proved reserves from supplemental data reported in companies' financial statements. Proved reserves are estimated by petroleum engineers, who are either company employees or external reserve engineers, and they can be quantified and compared among E&P companies. Proved reserves come from known reservoirs and can be produced with "reasonable certainty" under current pricing and technological operating assumptions. For financial reporting, reserve estimates are generally prepared annually.

Factor: Business Profile (10% weight)

Why it matters

The business profile of an E&P company indicates its capacity to generate recurrent streams of operating cash flow to support the ongoing capital investment necessary to sustain its reserves and production base in the long term. The E&P sector is a depleting asset business, and a company must continually replace the reserves it is producing through ongoing drilling and development capital expenditures.

Size and Diversity of Hydrocarbon Base

The size and diversity of an E&P company's hydrocarbon resource base, which extends beyond proved reserves, is an important consideration. While proved reserves constitute the most reliable indicator of a company's cash generating capacity in the next one to five years, other commercial reserves yet to be proven as well as contingent resources provide a useful indicator of a company's ability to access resources and replenish proved reserves, which will underpin its production profile in the longer term. Also, while unproven reserves and contingent resources typically consume cash as opposed to generating it, they may constitute a store of value and source of additional financial flexibility, which can be realized through the sale of assets (all or in part through partnerships and joint ventures) at different stages of the life of a project.

The geological make-up and geographical diversity of the company's asset base are also important considerations. The large E&P companies tend to operate in more geographic areas and geologic basins, providing significant protection from a range of industry conditions such as lower commodity prices, unexpected internal or regulatory and political disruptions to operations, quality or basis (location) differentials that affect realized prices, rising oilfield service or other cost inputs, and so on. In contrast, smaller E&P companies tend to concentrate in a single basin and commodity type. While this can provide the benefits of focused development activities and cost efficiency, it also typically means more concentrated geologic, commodity and basis pricing and transportation takeaway risks.

Project Execution Capabilities and Technological Know-How

The breadth and depth of its project execution capabilities and technological know-how are also important aspects of a company's business profile. To offset continuing depletion of conventional oil and gas basins, E&P companies have undertaken increasingly capital intensive unconventional resource development such as natural gas and oil production from shale and other reservoirs that require the application of higher cost and more technologically advanced drilling and well completion techniques. Larger E&Ps have also taken on complex upstream projects, such as deepwater development, and have ventured into new oil frontiers and more hostile operating environments that were once the lone purview of the major integrated oil companies.

Unconventional resource development has less geologic risk and a shorter lag between investment and production. However, the very high decline rates from shale production require higher drilling and completion activity just to keep production flat, let alone grow, thus requiring continuous improvements in drilling and development efficiencies and higher capital reinvestment requirements.

Conversely, operating in the deepwater and ultra-deepwater of the US Gulf of Mexico, West Africa and Brazil's offshore pre-salt oilfields presents E&P companies with significant technical challenges and entails higher execution and geologic risks. Also, the development of resources such as oil sands and integrated gas projects requires long lead times and considerable upfront investment.

In this context, on-time, on-budget, safe execution of these highly complex projects requires considerable technological expertise and extensive project management skills to achieve the attractive economic returns underpinned by the large size and commercial materiality of the fields under development. In more mature hydrocarbon provinces such as the conventional reservoirs in the Permian Basin of West Texas or the North Sea, the ability of operators to apply the latest enhanced oil-recovery techniques can significantly improve recovery rates and help extend the field lives and production profile of existing oilfields.

Diversification

There are potential diversification benefits for E&P companies that derive a meaningful level of cash flow from non-E&P businesses such as midstream, chemicals and natural gas distribution. These operations can create a hedge during cyclical downturns and supply additional cash flow to fund development of new E&P assets.

How we assess it for the scorecard

In scoring a company's business profile, we consider the size and diversity of the hydrocarbon base, the strength of its project execution capabilities, and the caliber of its technological know-how to arrive at an overall qualitative assessment of the core E&P business. We may score an E&P company with other business(es) that add diversification one category higher than the score indicated by its E&P business alone, depending on the profile and magnitude of those businesses and their contribution to greater cash flow stability. This concept applies only for companies with a core E&P business profile in the B to Aaa range. A company with an E&P core business profile that falls into the Caa or lower categories most likely has a material weakness, such as extremely small size, that is unlikely to be ameliorated by diversification into another sector that is itself, inherently, an even smaller business.

Factor: Profitability and Efficiency (25% weight)**Why it matters**

Profits matter because they are needed to generate sustainable cash flow and maintain a competitive position. Profitability and returns are key measures in this highly cyclical, commodity business. To achieve competitive returns, a company has to maintain a lean cost structure and control both its cash operating and capital costs, while optimizing the capital invested.

The E&P industry is also highly capital-intensive, so strong returns are critical to attracting low-cost debt and equity capital. While many of the larger E&P companies have the cash flow and financial wherewithal to fund sustaining capital spending internally, both larger and smaller companies frequently need to rely on external debt and equity capital to grow reserves and production volumes and to finance acquisitions.

The Leveraged Full-Cycle Ratio (LFCR) is an important component in analyzing the success and efficiency of a company's investment efforts across an investment cycle. It reflects the productivity of reinvested capital on a boe basis, comparing the cash margin generated by a produced boe with the capital costs needed to replace that boe. This important measure indicates whether a company generates a positive return on its overall production, and whether it is competitive with its peers.

The LFCR is a comprehensive metric that considers a company's oil and natural gas portfolio as reflected in its realized price, cash costs, and re-investment risk based on finding and development (F&D) costs. This measure provides an indication – regardless of costs or prices – about which companies are better at generating cash-on-cash returns. A company with an LFCR that is consistently higher than peers through varying price and cost environments is better able to withstand those variations, and to internally fund the replacement and growth of its reserve base.

F&D costs reflect the cost of acquisition, exploration and development across the portfolio, capturing the producer's ability to acquire assets at attractive prices and to control development costs. F&D cost is a measure of the total costs incurred to add and develop a boe of new reserves to the point of production. The lower a company's F&D costs, the more profitable its operations will be in a wider range of price environments. F&D costs are influenced by numerous variables, including the complexity and size of the reservoir, reserve booking practices, timing issues such as development approvals, and the length of the development cycle.

How we assess it for the scorecard**LEVERAGED FULL-CYCLE RATIO:**

We use the Leveraged Full-Cycle Ratio (LFCR). The numerator of the LFCR is the leveraged cash margin generated per boe of production. Cash margin per boe is the realized price per boe minus cash operating, general and administrative (G&A), and interest costs per boe. For realized prices, we strip out non-E&P revenue, but include realized hedging gains or losses. Realized prices also reflect the quality of the commodity produced and transportation or basis differentials.

The denominator in the LFCR is the F&D cost per boe. F&D costs are calculated by dividing total costs incurred (acquisitions + exploration + development + goodwill booked in corporate E&P acquisitions) by total boe reserve additions. Costs incurred are typically disclosed as part of the supplementary oil and gas information, while acquisition goodwill is generally disclosed in the financial statements.

For the purposes of calculating the LFCR metric on a historical basis, we use three-year average F&D costs — recognizing that the reserves replacement process typically spans several years, from the time capital is spent for initial work until reserves are proved, as well as follow-up exploration and development.

In some cases, scenarios using F&D costs over different time periods might be important to our analysis and informative for our forward view. For example, we often consider a longer view for oil sands steam assisted gravity drainage (SAGD) and mining and deepwater development, because these developments can take 5 years or more, with significant reserves added at the back-end of the development process. We also consider one-year F&D values to get a sense of recent performance and the direction of cost trends. Ultimately, all these historical data points help inform our view of what sustained F&D costs will be. This forward view of F&D, combined with our expectations for commodity prices, helps determine our opinion on the company's likely future full-cycle cost structure and returns.

Calculating the Leveraged Full-Cycle Ratio

Realized price per boe production (reflects basis differentials, transportation and hedging)

- » Minus: Operating costs per boe
- » Minus: Total G&A expense (including capitalized portion) per boe
- » Minus: Total interest expense (including capitalized portion) per boe

Equals: Leveraged pre-capex cash margin per boe

- » Divided by: Three year average all sources per boe F&D costs

Equals: Leveraged Full-Cycle Ratio

Factor: Leverage and Coverage (30% weight)

Why it matters

Leverage and coverage measures are indicators of a company's financial flexibility and long-term viability, including their ability to fund ongoing capital investments and adapt to changes in commodity prices and the regulatory environment in the regions in which they operate.

The factor comprises four sub-factors:

E&P Debt / Average Daily Production

The ratio of E&P debt to average daily production (E&P Debt/Average Daily Production) is an indicator of debt serviceability and leverage commonly used in this sector as a proxy for comparative financial strength. This metric measures leverage against an E&P company's production volumes, from which it generates cash flow, but does so without reference to the swings caused by commodity price fluctuations.

E&P Debt / Proved Developed Reserves

The ratio of E&P debt to proved developed reserves (E&P Debt/Proved Developed Reserves) is another indicator of debt serviceability and leverage commonly used in this sector as a proxy for comparative financial strength. This metric measures leverage against an E&P company's proved developed (PD) reserves, which are its primary cash-generating assets. Comparing E&P debt to PD reserves is conceptually similar to a "loan to value" measure. It is also analogous to the process that many banks use when calculating a borrowing base, which is typically done for smaller, non-investment-grade E&P companies.

RCF / Debt

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

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 four sub-factors: E&P Debt/Average Daily Production; E&P Debt/Proved Developed Reserves; RCF/Debt; and EBITDA/Interest Expense.

E&P DEBT:

Some E&P companies have significant other businesses, such as refining and marketing, midstream, chemicals, and natural gas distribution. These other businesses tend to be natural extensions of E&P, providing some diversification of both business risk and cash flow. We generally view these businesses as supporting credit quality and, by extension, the rating of the standalone E&P business. The denominators used as indicators of debt serviceability in the leverage ratios (E&P Debt/Average Daily Production and E&P Debt/Proved Developed Reserves) do not incorporate any benefit from the non-E&P business, so we use a numerator, E&P debt, also restricted to the E&P business. We estimate the amount of debt that the other operations could support while maintaining a similar credit profile and deduct that amount from total debt to determine E&P debt. The E&P leverage metrics are then calculated using E&P debt to determine E&P-only leverage. If a company's midstream assets service its own production, rather than a third party, we view them as an extension of the E&P business and make no adjustments for those assets.

In addition to our standard adjustments, for E&P companies we may adjust debt (both in total and for E&P debt) for transactions that are an alternative to direct capital spending, such as contractual commitments for using an offshore production facility, including in cases where the liability is not captured in our standard adjustment for leases. On the other hand, we generally exclude from the debt calculation any obligations that are akin to operating costs or reflect purchasing a service (such as drilling rig commitments or capacity commitments to secure pipeline transportation), even if the company reports these as lease liabilities that would typically be reclassified to debt for other non-financial corporations as part of our standard adjustment for leases.

E&P DEBT / AVERAGE DAILY PRODUCTION:

The numerator is E&P debt, and the denominator is average daily production volume.

E&P DEBT / PROVED DEVELOPED RESERVES:

The numerator is E&P debt, and the denominator is proved developed reserves.

RCF / DEBT:

The numerator is retained cash flow, and the denominator is total debt (total company debt, not E&P-only debt).

EBITDA / INTEREST EXPENSE:

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

Factor: Financial Policy (15% weight)**Why it matters**

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

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

Financial risk tolerance serves as a guidepost to investment and capital allocation. An expectation that management will be committed to sustaining an improved credit profile is often necessary to support an upgrade. For example, we may not upgrade 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 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 management³ is an important aspect of overall risk management and can provide insight into risk tolerance.

Many E&P companies have historically used acquisitions to spur production and reserve growth, expand into new geographic regions, consolidate acreage positions around existing properties, advance cost synergies or seek new development capabilities. The impact of an acquisition on a rating will invariably depend on the company's existing capital structure and the degree to which it is changed by the acquisition.

How we assess it for the scorecard

We assess the company's desired capital structure or targeted credit profile, history of prior actions, including its track record of risk and liquidity management, and 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, and regulatory pressures.

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

Other considerations

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

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

Management Strategy

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

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' assessment of internal controls and opinion on financial statements, and unusual restatements of financial statements or delays in regulatory filings may indicate weaknesses in internal controls.

Liquidity

Liquidity is an important rating consideration for all E&P companies given the inherent exposure to volatile commodity prices, although it may not have a substantial impact in discriminating between two issuers with a similar credit profile. 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.⁴

Liquidity is especially critical for speculative grade issuers, which typically have less operating and financial flexibility. We form an opinion on likely near-term liquidity requirements from the perspective of both sources and uses of cash. This may include monitoring bank covenants and compliance cushion to assess whether the company is likely to require covenant relief in the event of even a modest industry downturn or an issuer specific decline in performance.

Several unique attributes help E&P companies' liquidity. They typically have reserve-based financing structures, high EBITDA margins allowing for the generation of operating cash flow even in low commodity price environments, and the ability to raise cash by selling into the transparent and liquid market for oil and gas assets. They can also employ short-term deferrals of capital investment during periods of stress.

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 companies 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 companies 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 companies 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 maintaining substantial 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 in particular when these issuers have publicly stated financial targets based on net debt metrics.

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

Additional Metrics

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

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

Event Risk

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

Environmental, Social and Governance Considerations

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

Companies in the independent exploration and production sector are subject to a high degree of regulatory oversight, including environmental standards. Effects of these regulations include limitations on locations to explore for new resources, higher costs and capital investment requirements, product substitution, and intensifying risk of asset "stranding" — essentially, the risk that capitalized acquisition and development costs will not be recoverable because oil and gas reserves have been rendered uneconomic to produce, or because production is prohibited. When an E&P company causes significant environmental damage, such as through oil spills, it can face very large cash outflows for litigation, fines and remediation.

The global oil and gas industry faces significant risks from the global effort to curb greenhouse gas emissions. The credit impact that is most certain from carbon transition is lower demand and consequently lower prices for hydrocarbons, particularly oil. In addition to suppressing revenues and margins for E&P companies through lower demand, stricter environmental policies and regulations may also lead to higher costs. The severity and immediacy of these risks will depend on the extent of the carbon curbs and the timing for their implementation. In addition, the specific mechanisms used to curb carbon may affect certain regions or certain companies differently. While carbon transition efforts will have a negative credit impact on the entire industry, assessing differences in exposure to these risks across companies in the E&P sector will require transparent and extensive disclosure by oil and gas companies regarding the comprehensive nature of their asset bases and their strategy and governance in addressing carbon transition risk.

The long-term nature of carbon transition risks may mean that they are not fully reflected in our published scorecards. Forward-looking published scorecards are typically based on our near-term projections, in part because we may not have sufficient visibility into an issuer's future results beyond this horizon that would enable us to accurately score these factors. As for other long-term risks that may not be quantifiable in a forward view of financial metrics, carbon transition risks are incorporated into our ratings analysis qualitatively, based on our view of trends that extend beyond the horizon for which more precise projections are practicable. As a result, carbon transition risks may over time cause our ratings to be lower than scorecard-indicated outcomes for some companies in this sector.

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

Regulatory Considerations

Companies in the independent exploration and production sector are subject to varying degrees of regulatory oversight. As noted in the "Environmental, Social and Governance Consideration" section, effects of these regulations may entail limitations on locations to explore for new resources, higher costs and capital investment requirements, product substitution, and intensifying risk of asset "stranding." 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 and affects the scenario analyses we may undertake 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. In some circumstances, regulatory considerations may also be a rating factor outside the scorecard, for instance when regulatory change is swift.

Parental Support

Ownership can provide ratings lift for a particular E&P company 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 E&P company in times of stress or financial need (e.g., a major capital investment), 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.⁶ 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 E&P companies have received government or banking support in the event of financial difficulties because of the strategic importance of the oil and gas sector and the heavy reliance on oil and LNG imports. 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.

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,⁷ 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,⁸ 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 adjustments⁹ to income statement, cash flow statement and balance sheet amounts for items such as underfunded pension obligations and operating leases. We may also make other analytical adjustments that are specific to a particular company.

2. Mapping scorecard factors to a numeric score

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

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

Exhibit 3

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

Source: Moody's Investors Service

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

Exhibit 4

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

Source: Moody's Investors Service

3. Determining the overall scorecard-indicated outcome

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

Exhibit 5

Scorecard-indicated outcome

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

Source: Moody's Investors Service

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

In general, the scorecard-indicated outcome is oriented to the corporate family rating (CFR) for speculative-grade issuers and 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.¹⁰

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.¹¹

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.¹²

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.¹³

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.¹⁴ 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.

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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 rating considerations" section.
- [4](#) A link to a list of our cross-sector methodologies can be found in the "Moody's related publications" 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](#) 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.
- [7](#) 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.
- [8](#) 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.
- [9](#) 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.
- [10](#) A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.
- [11](#) 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.
- [12](#) A link to a list of our sector and cross-sector rating methodologies can be found in the "Moody's related publications" section.
- [13](#) 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 methodologies can be found in the "Moody's related publications" section.

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