MOODY'S
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RATING METHODOLOGY
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Rating Methodology

Pharmaceuticals

This rating methodology replaces the *Pharmaceutical Industry* methodology published in June 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 We have removed outdated information.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 sale of pharmaceutical products. Pharmaceuticals typically require a prescription from a physician or healthcare provider, and thereby are different from typical consumer healthcare products that are sold over the counter. Pharmaceutical companies operate under regulatory oversight in many areas, including research and clinical trials, product approval, product labeling, manufacturing standards, and product safety. Some companies rated under this methodology derive revenue from other lines of business.

The global rated universe covers a wide range of business models. Pharmaceutical companies covered under this methodology include: (i) branded drug companies, which are engaged in the research and development of novel, patent-protected medicines; (ii) generic drug companies, which offer products that have gone off-patent by the branded pharmaceutical industry; and (iii) hybrid companies offering a blend of branded and generic products.

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

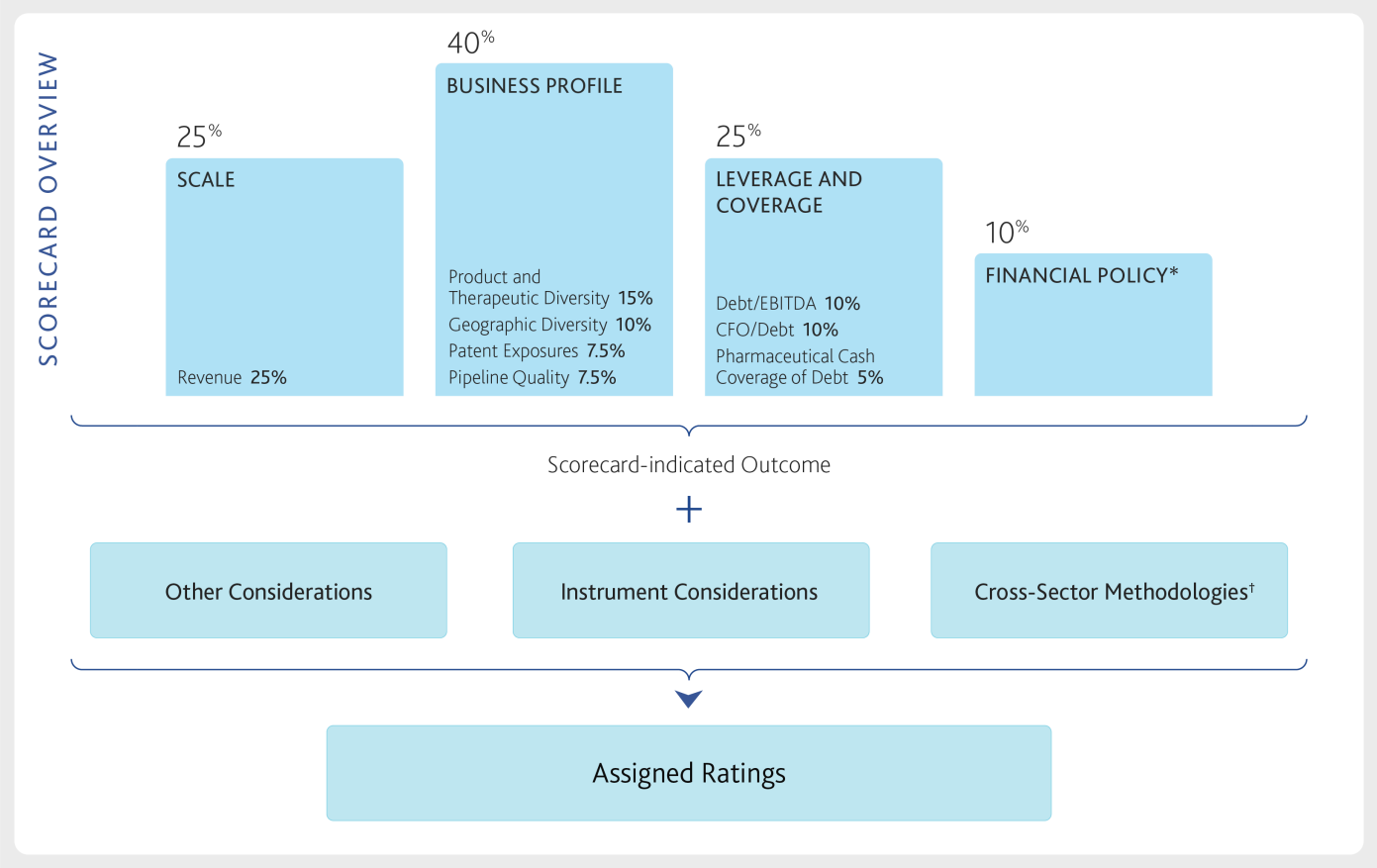
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the pharmaceutical 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 pharmaceutical companies, which includes the use of a scorecard.[1] 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 pharmaceuticals 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

Pharmaceuticals 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

Pharmaceuticals scorecard

	SCALE (25%)	BUSINESS PROFILE (40%)				LEVERAGE and COVERAGE (25%)			FINANCIAL POLICY (10%)
	Revenue (USD Billion)[1] (25%)	Product and Therapeutic Diversity (15%)	Geographic Diversity (10%)	Patent Exposures (7.5%)	Pipeline Quality (7.5%)[2]	Debt / EBITDA[3] (10%)	CFO / Debt[4] (10%)	Pharmaceutical Cash Coverage of Debt[5] (5%)	
Aaa	≥ $60	**Branded Companies**: Extremely well diversified across segments, therapeutic categories and products. For example, the top 3 products are usually not expected to drive more than 25% of revenue. **Generic Companies**: Extremely well diversified across business lines, products and delivery modes. For example, over 50% of operating earnings may be derived from segments other than generic drugs.	Extremely well diversified geographically. For example, strong presence in at least 3 different major regions, as well as in a number of emerging markets, with the largest single region usually not expected to exceed 40% of total revenue.	**Branded Companies**: Extremely low exposure to patent expirations and challenges. For example, revenue exposure usually not expected to exceed 10% over the next 3 years. **Generic Companies**: Extremely high barriers to entry to competing generic threats, usually resulting in expected gross margins > 80%.	**Branded Companies**: Excellent pipeline quality, innovation and diversity. For example, peak pipeline sales usually greater than 30% of current revenue base. **Generic Companies**: Excellent pipeline. For example, may have >= 250 ANDAs or similar filings and a very strong focus on biosimilars.	≤ 1x	≥ 75%	≥ 75%	Expected to have extremely conservative financial policies (including risk and liquidity management); very stable metrics; essentially no event risk; and public commitment to very strong credit profile over the long term.
Aa	$30 - $60	**Branded Companies**: Very well diversified across segments, therapeutic categories and products. For example, the top 3 products are usually not expected to drive more than 30% of revenue. **Generic Companies**: Very well diversified across business lines, products and delivery modes. For example, over 40% of operating earnings may be derived from segments other than generic drugs.	Very well diversified geographically. For example, strong presence in at least 3 different major regions, as well as in a number of emerging markets, with the largest single region usually not expected to exceed 45% of revenue.	**Branded Companies**: Very low exposure to patent expirations and challenges. For example, revenue exposure usually not expected to exceed 15% over the next 3 years. **Generic Companies**: Very high barriers to entry to competing generic threats, usually resulting in expected gross margins > 70%.	**Branded Companies**: Strong pipeline quality, innovation and diversity. For example, peak pipeline sales usually greater than 25% of current revenue base. **Generic Companies**: Strong pipeline. For example, may have 200-249 ANDAs or similar filings and a good focus on biosimilars.	1 - 1.75x	50 - 75%	40 - 75%	Expected to have very conservative financial policies (including risk and liquidity management); stable metrics; minimal event risk that would cause a rating transition; and public commitment to strong credit profile over the long term.

	SCALE (25%)	BUSINESS PROFILE (40%)				LEVERAGE and COVERAGE (25%)			FINANCIAL POLICY (10%)
	Revenue (USD Billion)[1] (25%)	Product and Therapeutic Diversity (15%)	Geographic Diversity (10%)	Patent Exposures (7.5%)	Pipeline Quality (7.5%)[2]	Debt / EBITDA[3] (10%)	CFO / Debt[4] (10%)	Pharmaceutical Cash Coverage of Debt[5] (5%)	
A	$15 - $30	**Branded Companies**: Well diversified across segments, therapeutic categories and products. For example, the top 3 products are usually not expected to drive more than 40% of revenue. **Generic Companies**: Well diversified across business lines, products and delivery modes. For example, over 30% of operating earnings may be derived from segments other than generic drugs.	Well diversified geographically. For example, strong presence in at least 3 different major regions, as well as in a number of emerging markets, with the largest single region usually not expected to exceed 55% of revenue.	**Branded Companies**: Low exposure to patent expirations and challenges. For example, revenue exposure usually not expected to exceed 20% over the next 3 years. **Generic Companies**: High barriers to entry to competing generic threats, usually resulting in expected gross margins > 60%.	**Branded Companies**: Very good pipeline quality, innovation and diversity. For example, peak pipeline sales usually greater than 20% of current revenue base. **Generic Companies**: Very good pipeline. For example, may have 150-199 ANDAs or similar filings and a focus on biosimilars.	1.75 - 2.5x	35 - 50%	25 - 40%	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	$6 - $15	**Branded Companies**: Moderately diversified across segments, therapeutic categories and products. For example, the top 3 products are usually not expected to drive more than 50% of revenue. **Generic Companies**: Moderately diversified across business lines, products and delivery modes. For example, over 20% of operating earnings may be derived from segments other than generic drugs.	Moderately diversified geographically. For example, strong presence in at least 2 regions, with the largest single region usually not expected to exceed 65% of revenue.	**Branded Companies**: Moderate exposure to patent expirations and challenges. For example, revenue exposure usually not expected to exceed 25% over the next 3 years. **Generic Companies**: Moderate barriers to entry to competing generic threats, usually resulting in expected gross margins > 50%.	**Branded Companies**: Moderately good pipeline quality, innovation and diversity. For example, peak pipeline sales usually greater than 15% of current revenue base. **Generic Companies**: Moderately good pipeline. For example, may have 100-149 ANDAs or similar filings and may be pursuing biosimilars, but with uncertain market position.	2.5 - 3.25x	25 - 35%	15 - 25%	Expected to have financial policies (including risk and liquidity management) that balance the interests of creditors and shareholders; some risk that debt-funded acquisitions or shareholder distributions could lead to a weaker credit profile.
Ba	$3 - $6	**Branded Companies**: Somewhat weakly diversified across segments, therapeutic categories and products. For example, the top 3 products are usually expected to drive more than 50% of revenue. **Generic Companies**: Somewhat weakly diversified across business lines, products and delivery modes. For example, less than 20% of earnings may be derived from segments other than generic drugs; or pure-play generic company very well diversified across products and delivery modes.	Somewhat concentrated geographically. For example, may have concentration of 65%-75% of revenue in one region, with good diversity outside of this region.	**Branded Companies**: Moderately high exposure to patent expirations and challenges. For example, revenue exposure usually not expected to exceed 30% over the next 3 years. **Generic Companies**: Somewhat low barriers to entry to competing generic threats, usually resulting in expected gross margins > 40%.	**Branded Companies**: Somewhat limited pipeline quality, innovation or diversity. For example, peak pipeline sales usually less than 15% of current revenue base. **Generic Companies**: Somewhat limited pipeline. For example, may have 60-99 ANDAs or similar filings and/or a lack of biosimilars.	3.25 - 4.5x	15 - 25%	10 - 15%	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.

	SCALE (25%)	BUSINESS PROFILE (40%)				LEVERAGE and COVERAGE (25%)			FINANCIAL POLICY (10%)
	Revenue (USD Billion)[1] (25%)	Product and Therapeutic Diversity (15%)	Geographic Diversity (10%)	Patent Exposures (7.5%)	Pipeline Quality (7.5%)[2]	Debt / EBITDA[3] (10%)	CFO / Debt[4] (10%)	Pharmaceutical Cash Coverage of Debt[5] (5%)	
B	$1 - $3	**Branded Companies**: Weakly diversified across segments, therapeutic categories and products. For example, the top 3 products are usually expected to drive more than 60% of revenue. **Generic Companies**: Weakly diversified across business lines, products and delivery modes. For example, less than 10% of operating earnings may be derived from segments other than generic drugs; or pure-play generic company moderately diversified across products and delivery modes.	Regionally very concentrated. For example, concentration of 75%-90% of revenue in one region.	**Branded Companies**: High exposure to patent expirations and challenges. For example, revenue exposure usually likely to exceed 30% over the next 3 years. **Generic Companies**: Low barriers to entry to competing generic threats, usually resulting in expected gross margins < 40%.	**Branded Companies**: Limited pipeline quality, innovation or diversity. For example, peak pipeline sales usually less than 10% of current revenue base. **Generic Companies**: Limited pipeline. For example, may have 30-59 ANDAs or similar filings and/or a lack of biosimilars.	4.5 - 6x	5 - 15%	5 - 10%	Expected to have financial policies (including risk and liquidity management) that favor shareholders over creditors; high financial risk resulting from shareholder distributions, acquisitions or other significant capital structure changes.
Caa	$0.5 - $1	**Branded Companies**: Very weakly diversified across segments, therapeutic categories or products. For example, the top 3 products are usually expected to drive more than 70% of revenue. **Generic Companies**: Very weakly diversified across business lines, products and delivery modes. For example, pure-play generic company with limited diversity across products or delivery modes.	Regionally extremely concentrated. For example may have > 90% of revenue in one region if the region has a diverse payor mix.	**Branded Companies**: Very high exposure to patent expirations and challenges. For example, revenue exposure usually likely to exceed 40% over the next 3 years. **Generic Companies**: Very low barriers to entry to competing generic threats, usually resulting in expected gross margins < 30%.	**Branded Companies**: Weak pipeline quality, innovation or diversity. For example, peak pipeline sales usually less than 5% of current revenue base. **Generic Companies**: Weak pipeline. For example, may have 15-29 ANDAs or similar filings and/or a lack of biosimilars.	6 - 7.5x	0 - 5%	2 - 5%	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	< $0.5	**Branded Companies**: Lack of diversification. For example, substantially reliant upon only one product. **Generic Companies**: Lack of diversification. For example, pure-play generic company with weak diversity across products or delivery modes.	Minimal geographic diversification. For example, may have > 90% of revenue in one region with a limited number of payors.	**Branded Companies**: Extremely high exposure to patent expirations and challenges. For example, revenue exposure usually likely to exceed 50% over the next 3 years. **Generic Companies**: Highly commodity-like portfolio of products, usually resulting in expected gross margins < 20%.	**Branded Companies**: Essentially no internal late-stage pipeline; may rely solely on external R&D. **Generic Companies**: Very weak pipeline. For example may have < 15 ANDAs or similar filings with a lack of biosimilar.	> 7.5x	< 0%	< 2%	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.

[1] For the linear scoring scale, the Aaa endpoint value is $100 billion. A value of $100 billion or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero equates to a numeric score of 20.5.
[2] ANDAs are Abbreviated New Drug Applications filed in the US. For companies with a material US presence, we typically focus solely on ANDA filings, because filings in other jurisdictions generally overlap with these US filings.
[3] 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.
[4] For the linear scoring scale, the Aaa endpoint value is 100%. A value of 100% or better equates to a numeric score of 0.5. The Ca endpoint value is (5)%. A value of (5)% or worse equates to a numeric score of 20.5.
[5] For the linear scoring scale, the Aaa endpoint value is 100%. A value of 100% or better equates to a numeric score of 0.5. The Ca endpoint value is 0%. A value of 0% equates to a numeric score of 20.5.
Source: Moody's Investors Service

Discussion of the scorecard factors

In this section, we explain our general approach for scoring each scorecard factor or sub-factor, and we describe why they are meaningful as credit indicators.

Factor: Scale (25% weight)

Why it matters

Larger scale is an important indicator for a company's ability to influence business trends and pricing and to support a stable or growing market position. Scale also can be an indicator for greater resilience to changes in demand and for geographic diversity. In addition, scale gives pharmaceutical companies leverage with the suppliers of active pharmaceutical ingredients, as well as customers, including drug wholesalers, pharmacy benefit managers and other healthcare payors.

Large scale also provides companies with greater discretionary budgets for research and development (R&D) and capital expenditures, which are essential to maintaining the drug development pipeline.

For generic drug companies, scale is especially critical due to ongoing pricing pressure on generic drugs and the obvious advantage of spreading fixed costs over a larger revenue base. Larger scale for generic companies is typically associated with strong relationships with drug store chains and good legal capabilities required to successfully challenge branded drug patents.

How we assess it for the scorecard

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

Factor: Business Profile (40% weight)

Why it matters

The business profile of a pharmaceutical company provides an important indication of the company's strength based on several measures of diversification, its exposure to patent expirations and other forms of competition, and its ability to replenish declining revenue with opportunities from its drug pipeline.

Product and Therapeutic Diversity

Business model diversity at the product and therapeutic level is important because it helps reduce a firm's exposure to numerous risks that can cause a product's revenue to erode. For branded companies, such risks include patent expirations, product safety issues, the introduction of a competitor's product or a manufacturing disruption. Operating across many different therapeutic categories provides an extra dimension of diversity, since multiple products within a therapeutic category can be affected if a competitor introduces a new product.

For generic drug companies, diversity is important but has a different meaning. Most generic companies are well diversified at the product level, but generic drugs are commodity-like, so product diversity itself may not lead to lower business risk. Other dimensions of business diversity are more important. For example, generic companies may diversify by offering less traditional product types, such as liquids, inhalers, injectables and ointments, in addition to traditional products sold as pills and capsules, which are the most commoditized. In addition, generic companies operating other business lines are less affected by pricing pressure or other risks in their generic segment. Several generic companies have branded drug businesses, distribution businesses and active pharmaceutical ingredients businesses, all of which help reduce concentration in the pure-play generic drug business.

Geographic Diversity

Geographic diversity helps mitigate the potential reduction in profitability that can arise from exposure to regulatory or other issues that are more stringent in one region than in another. Business risks that vary by geographic region include payor negotiating leverage, pricing and budgetary pressures, healthcare reform, hurdles for regulatory approvals, workforce restructuring constraints, competition, and prevalence of litigation risks. In geographic markets with a single payor (such as a governmental entity), pricing pressure can result because the payor has authority to reduce prices. In contrast, markets with numerous payors generally afford pharmaceutical firms more pricing power than single payor markets. The single versus numerous payor distinction is critical for companies highly concentrated in one market, since concentration in a single payor market is much riskier than concentration in a market with numerous payors.

Patent Exposures

For a branded pharmaceutical company, long-lived patents are a strong barrier to entry. Patent expirations can lead to a sudden and often dramatic falloff in revenue once generic competition enters the market. The impact on profits and cash flow is often much more pronounced than the impact on revenue because products near the end of their life cycles may have very high gross margins after many years of price increases. In addition, it is difficult to scale back R&D costs and selling, general and administrative (SG&A) expenses on a basis proportional to the revenue reduction. Meanwhile, if successful, patent challenges from generic companies can cause a substantial loss of revenue years before the scheduled patent expiration.

For a generic pharmaceutical company, barriers to entry are also important because they diminish the potential for competition to erode profits. The concept of patent expiration does not readily distinguish one company from another, since the revenue base consists of products that have already lost patent protection. However, generic companies face revenue and margin declines from share loss and price erosion when other generic companies launch similar versions of their products. Generic companies that offer products that are more difficult to replicate or that have higher barriers to entry, which may include extended-release products, hormonal contraceptives and injectable products, can buffer themselves from these risks.

Pipeline Quality

The ability to offset the revenue lost to patent expiration by successfully commercializing products from the pipeline is critical to the long-term viability of branded pharmaceutical companies. A strong pipeline generating a string of blockbusters can establish a company's leadership in a therapeutic category like diabetes or oncology. Companies with strong pipelines are more likely to attract top scientists. Further, the combination of high patent exposures and a modest or a weak pipeline may also be a precursor to large-scale acquisitions for branded drug companies.

Although generic drug companies do not engage in the same type of R&D as branded drug companies, the product pipeline remains a critical indicator of future sales. The number of submitted product applications serves as an important indicator of the quality of the generic pipeline. A strong pipeline with many pending product applications shows strong competencies in chemistry and drug formulation skills, access to raw ingredients and manufacturing compliance standards. Rather than performing clinical trials to demonstrate that their products are safe and effective in treating diseases, generic companies need only demonstrate that their products are equivalent to the referenced branded product. A generic drug company' competency in challenging the patents of branded pharmaceutical companies is important to expanding its product line. Such opportunities can be lucrative for generic drug companies because regulatory statutes can extend periods of generic marketing exclusivity before other generic entrants are allowed. As patents expire on blockbuster biotech drugs, some generic companies will benefit from the production of biosimilar products. However, developing biosimilar products is much more complex than developing traditional products and requires significant capabilities in product development and manufacturing, which not all generic companies possess.

How we assess it for the scorecard

Scoring for this factor is based on four sub-factors: Product and Therapeutic Diversity; Geographic Diversity; Patent Exposures; and Pipeline Quality.

PRODUCT AND THERAPEUTIC DIVERSITY:

For branded companies, we assess diversity primarily based on reported or estimated revenue breakdowns by products, therapeutic areas and business segments. We use multiple dimensions in assessing product and therapeutic diversity for branded companies. Our key considerations include but are not limited to the following:

» The proportion of total company revenue derived from the company's three largest products.

» The number of different therapeutic categories in which the company operates. For instance, two companies might have a similar portion of their revenues from their top three products, but we would view one with products spanning different therapeutic categories as more diverse than one with all three products in the same therapeutic category.

» In assessing product and segment diversity, we consider the size and profitability from business units outside of pharmaceuticals, such as consumer products, animal health and medical devices. A high proportion of revenue from these non-pharmaceutical businesses, especially if there is diversity within these businesses, significantly enhances a company's diversity at the product and therapeutic level.

For generic companies, while we consider diversity at the product level, it is typically strong, as explained above, and usually less important in our assessment. Also, it is often not disclosed by companies. Therefore, in our diversity assessment we consider several additional dimensions, such as diversity across drug delivery platforms. For instance, a company primarily offering tablets and capsules is less diverse than a company offering tablets, capsules, inhalers, injectables, ointments and patches. In addition, we consider whether the company operates in any segments other than generic pharmaceuticals, and the degree to which such segments enhance overall profitability, typically based on segment reporting.

GEOGRAPHIC DIVERSITY:

Our forward-looking assessment of geographic diversity is typically based on geographic revenue breakdowns provided in annual and quarterly reports. Well-diversified drug companies are not overly reliant on one geographic market. Although not all companies classify regions in the same manner in their financial reporting, most companies report their revenue breakdown across these regions: the US, Europe, Japan and emerging markets. We consider the portion of a company's sales derived from its largest geographic region as well as its presence in emerging markets. Drug companies with strong global diversification have a good sales presence in such regions, which are faster-growing than other markets.

We also consider the sales breakdown beyond just the company's top market. Two companies could have the same percentage of sales coming from their top region, but one company could operate in numerous other regions or markets, and we would typically consider it the more diverse of the two while the other might have concentrated exposure to one additional region or market and we would typically consider it less diverse. Diversity within a region is also important. If Europe represents 60% of revenue for two companies, one could derive 50% of its revenues in France, while the other could be more broadly diversified across Europe. In particular, a firm with high revenue concentration in a single region or market that generates a small percentage of the world's GDP is likely to be scored as less diverse than a firm with high revenue concentration in a developed market.

In addition, some geographic markets have single payors while others, including the US, have numerous payors. Companies with significant geographic concentration in a key market will score less favorably if this concentration is in a single-payor market because of higher exposure to pricing pressure created by payor leverage.

PATENT EXPOSURES:

For branded companies, our assessment is based on the degree to which a company faces a loss of revenue or cash flow from upcoming patent exposures. We estimate the percentage of current revenue or cash flow (generally based on a last twelve month (LTM) period) likely to be lost due to patent expirations and patent challenges over the next three years. Beyond three years we consider this risk qualitatively. Our estimates may include the following considerations:

» Revenue declines after patent expirations vary by geographic region. For patent exposures in the US market, we generally estimate that 100% of the revenues will be lost. For revenues in other countries, we generally estimate a lower percentage of revenue based on the typical erosion curves observed in those markets, which vary based on country and common local market practice.

» For products with a known upcoming patent expiration but where we estimate that generic companies will be delayed due to technical or other reasons, analysts estimate the percentage of revenue likely to be lost, evaluated on a case-by-case basis.

» For products facing pre-patent expiration challenges by generic companies, we will also include a percentage of the revenue, typically ranging from 10% to 50%, to reflect an estimated likelihood that the generic company could be successful, evaluated on a case-by-case basis.

» For biotech products facing upcoming patent expirations, we typically expect slower post-patent erosion and thus apply a percentage of revenue, typically ranging from 25% to 50%, based on our assessment of the likely timing of biosimilars and the potential impact on revenue. This reflects our view that there will generally be fewer biosimilar competitors compared to traditional generic products, and a lower degree of price discounting, resulting in less rapid erosion of revenue.

For generic companies, we primarily use a forward-looking estimate of gross margin, informed by LTM financials, as a proxy for the level of barriers to entry facing the product portfolio. Generic drug companies with very high gross margins are likely offering harder-to-manufacture products and are likely to face fewer competitors. Meanwhile, generic drug companies with low margins are likely offering more commodity-like products and are not well protected from competitive threats or pricing pressure.

For both branded and generic companies, we also consider any unique situations involving abnormally high pricing pressure on key products, which can arise if payors demand higher rebates or if government payors implement large price cuts. The resulting price reduction can impact a company's financial performance in a manner similar to a product rolling off patent, and can therefore affect our assessment of this sub-factor.

For companies with both branded and generic business segments, we consider the patent exposures and barriers to entry within each to arrive at an overall blended score.

PIPELINE QUALITY:

For branded companies, in our assessment of pipeline quality we consider pipeline diversity and innovation. Our assessment of pipeline quality is primarily based on our estimate of peak sales from pipeline compounds in late-stage development, and we may also consider the degree of product risk. We consider peak pipeline sales relative to the current revenue base, typically using LTM total revenue as the reference point.

In arriving at our estimates, we typically consider the size of the therapeutic category, the level of unmet medical need and the competitive environment, among other factors. For branded drug companies, our estimates may be further informed by the uncertainties related to timing of approval and launch, pricing, labeling (narrow versus broad safety warnings), the impact of related products going generic, and the impact of future market entrants from other companies' pipelines. We often compare and contrast our estimates to those from other market participants when available. We may adjust peak sales for a given product upward or downward over time as new data emerges, or for other reasons, including competitive dynamics. We primarily consider only those products in late-stage development (in the US, Phase III clinical trials or later) because probability of success for earlier stage products is less certain and the development time frame is longer. Other factors that we typically consider in our assessment include the following:

» The degree of approval risk. For instance, we generally consider pipeline drugs high-risk opportunities when many companies have unsuccessfully attempted Phase III trials (Alzheimer's disease treatments have been a notable example). As such, we may adjust peak sales for certain products downward to reflect a lower probability of success.

» The degree of product diversity in the pipeline. For instance, two companies could have the same aggregate peak sales estimate, but for one company it substantially relates to one key pipeline drug, while for another company it is spread across many different drugs. The latter company would likely score higher in this sub-factor.

» We consider line extensions of existing products on a case-by-case basis, since line extensions frequently do not lead to significant incremental sales, and we usually haircut the incremental sales estimate by up to 75%. The rationale for this reduction includes the difficulty in estimating incremental sales, the potential that some off-label use could already be occurring, and our view that new chemical compounds add more strength to the pipeline.

» For companies with substantial operations outside of branded pharmaceuticals (which may include consumer products, medical devices, diagnostics or animal health, among others), we do not explicitly project peak sales for the product launches that could arise from these business segments, since many of them could cannibalize existing product lines. However, a company's level of innovation in its other business segments can favorably impact its score for this sub-factor.

Generic companies rarely disclose the full details regarding which products are in their pipelines. Instead, we typically evaluate the number of disclosed regulatory filings and first-to-file opportunities, as well as the potential success of any patent challenges. For companies that have a material presence in the US, this assessment is primarily based on a count of Abbreviated New Drug Application (ANDA) filings.[2] In non-US markets, companies follow other regulatory approval procedures (which may be similar to the ANDA process). To assess pipelines for generic companies that do not have a material presence in the US generic market, we use available equivalent data sources to approximate the number of unique compounds in the pipeline that have been submitted for regulatory approval. For generic companies, we also consider the extent to which the pipeline involves the development of biosimilar products.

For companies with both branded and generic business segments, we consider the pipeline scores within each to arrive at an overall blended score.

Factor: Leverage and Coverage (25% weight)

Why it matters

Leverage and coverage measures are indicators for a company's financial flexibility and long-term viability, including its ability to adapt to changes in the economic and business environments in the segments in which it operates.

The 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.

CFO / Debt

The ratio of cash flow from operations to debt (CFO/Debt) is an indicator of a company's ability to repay its debt. It is a measure or estimate for cash flow generation after working capital movements in relation to total debt.

Pharmaceutical Cash Coverage of Debt

Pharmaceutical cash coverage of debt provides an indication of a company's financial flexibility and ability to absorb unforeseen events or make strategic acquisitions. It may also indicate that the company has pre-financed upcoming debt maturities. Maintaining high cash coverage of debt helps buffer a company against many of the operating risks of the industry and may also allow it to more readily absorb setbacks, such as litigation payments.

How we assess it for the scorecard

Scoring for this factor is based on three sub-factors: Debt/EBITDA; CFO/Debt; and Pharmaceutical Cash Coverage of Debt.

DEBT/ EBITDA:

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

CFO / DEBT:

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

PHARMACEUTICAL CASH COVERAGE OF DEBT:

The numerator is pharmaceutical cash, defined as cash plus short-term investments plus long-term investments, with certain additional adjustments, described below. The denominator is total debt.

We make certain adjustments when assessing pharmaceutical cash. For example, we may haircut certain types of fixed income investments if we believe the volatility is high or the liquidity is weak. Our cash coverage of debt ratio does not generally give credit for equity investments, although on a case-by-case basis these investments may be taken into account when calculating pharmaceutical cash for this sub-factor, provided the liquidity of the security is very high and also depending on the volatility of the security. The haircut for such equity investments is typically substantial.

Factor: Financial Policy (10% 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 of 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 the ratings of a company that has built flexibility within its rating category if we believe that the company will use that flexibility to fund a strategic acquisition, cash distribution to shareholders, spin-off or other leveraging transaction. Conversely, a company's credit rating may be better able to withstand a moderate leveraging event if management places a high priority on returning credit metrics to pre-transaction levels and has consistently demonstrated the commitment to do so through prior actions. Liquidity management[3] is an important aspect of overall risk management and can provide insight into risk tolerance.

Many pharmaceutical companies have historically used acquisitions to spur revenue growth, expand business lines, consolidate market positions, advance cost synergies or seek access to new areas of R&D.

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.

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 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.

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 the 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.

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in the pharmaceutical industry. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[4]

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.

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.

Liquidity

Liquidity is an important rating consideration for all pharmaceutical 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 influenced 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]

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 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, while one of our ratios captures cash balances, 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 for an enduring approach that will benefit creditors. For instance, some companies have a policy to routinely pre-fund upcoming required debt payments well in advance of the stated maturity. Such companies may also have clearly stated financial targets based on net debt metrics and a track record of maintaining their financial profile within those targets.

While the scorecard in this methodology uses two leverage ratios with total (gross) debt rather than net debt (Debt / EBITDA and Cash Flow from Operations / Debt), we do consider excess cash holdings in our rating analysis, including in the ratio of cash to debt as well as 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, and the scorecard incorporates cash with the Pharmaceutical Cash Coverage of Debt sub-factor, 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. 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.

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 — can overwhelm even a stable, well-capitalized firm. Some other types of event risks include M&A, asset sales, spin-offs, litigation, pandemics, significant cyber-crime events and shareholder distributions.

Regulatory Considerations

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

Our view of future regulations plays an important role in our expectations of future financial metrics as well as our confidence level in the ability of an issuer to generate sufficient cash flows relative to its debt burden over the medium and longer term. Regulatory considerations also play a role in our assessment of a company's geographic diversity and pipeline quality. In some circumstances, regulatory considerations may also be a rating factor outside the grid; for instance, when regulatory change is swift.

Parental Support

Ownership can provide ratings lift for a particular company in the pharmaceutical industry 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 supply 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.[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 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.

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 adjustments[9] 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.[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.

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

2 ANDA filings are production applications awaiting regulatory review and are specific to the US generic pharmaceuticals market. For companies with a material presence in the US, we typically focus solely on ANDA filings, because filings in other jurisdictions generally overlap with these US filings.

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 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.

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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