MOODY'S INVESTORS SERVICE

RATING METHODOLOGY
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Rating Methodology

Telecommunications Service Providers

This rating methodology replaces the *Telecommunications Service Providers* methodology published in January 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 We have removed outdated information.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 providing telecommunications services to other businesses or consumers.

*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.

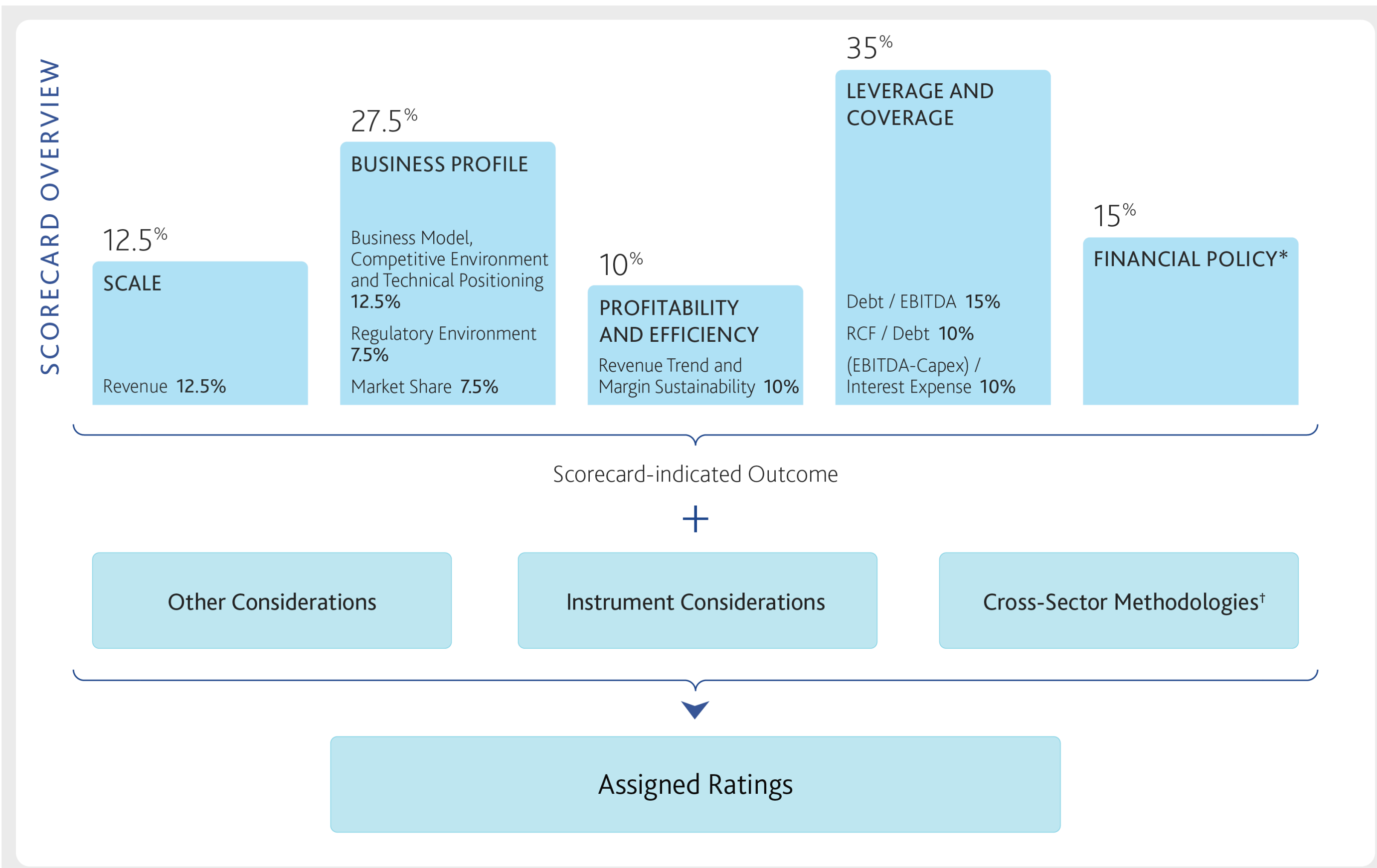
Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the telecommunications service provider 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 telecommunications service providers, 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 telecommunications service providers 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

Telecommunications service providers 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
Telecommunications service providers scorecard

	SCALE (12.5%)	BUSINESS PROFILE (27.5%)					PROFITABILITY and EFFICIENCY (10%)	LEVERAGE and COVERAGE (35%)			FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (12.5%)	Business Model, Competitive Environment and Technical Positioning - Diversified Carriers (12.5%)	Business Model, Competitive Environment and Technical Positioning - Wireless Carriers (12.5%)	Business Model, Competitive Environment and Technical Positioning - Wireline-only Carriers (12.5%)	Regulatory Environment (7.5%)	Market Share (7.5%)	Revenue Trend and Margin Sustainability (10%)	Debt / EBITDA (x)[3] (15%)	RCF / Debt (%)[4] (10%)	(EBITDA - CAPEX) / Interest Expense (x)[5] (10%)	Financial Policy (15%)
Aaa	≥ $100	Strong geographically diversified incumbent national provider of full suite of integrated services to a broad customer base with wireline and wireless segments exposed to very limited competitive challenges; and very successful international expansion; and very low technology risk.	N.A.	N.A.	Regulatory framework is fully developed, has a very long-track record of being extremely predictable and stable, and is extremely supportive of Return on Investment (ROI) for incumbent telecom providers and is very unlikely to change; and regulatory body is located in a highly rated sovereign with very strong institutional framework and effectiveness or strong independent regulator with unquestioned authority over telecom regulation that is national in scope; and very unlikely awards of new operating concessions.	Company is the principal player in the local market and in most of the regions where it operates. OR Company has monopoly-type presence in its local region.	On a sustainable basis: Strong revenue growth AND Exceptional margin levels.	≤ 0.5x	≥ 60%	≥ 8x	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	$50 - $100	National incumbent provider of full suite of integrated services to a broad customer base with wireline and wireless segments exposed to limited competitive challenges; and successful international expansion; and low technology risk.	N.A.	N.A.	Regulatory framework is fully developed, has a long track record of being very predictable and stable, and is highly supportive of ROI for incumbent telecom providers and is unlikely to change; and regulatory body is typically located in a high to moderate rated sovereign with strong institutional framework and effectiveness or strong independent regulator with authority over most telecom regulation that is national in scope; and unlikely awards of new operating concessions.	Company is a clear market leader in the local market and holds competitive positions in all regions where it operates. OR Company is the principal player and very strong market leader in its local region.	On a sustainable basis: Moderate revenue growth AND Very high margin levels.	0.5x - 1x	45% - 60%	6.5x - 8x	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

	SCALE (12.5%)	BUSINESS PROFILE (27.5%)					PROFITABILITY and EFFICIENCY (10%)	LEVERAGE and COVERAGE (35%)			FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (12.5%)	**Business Model, Competitive Environment and Technical Positioning - Diversified Carriers (12.5%)**	**Business Model, Competitive Environment and Technical Positioning - Wireless Carriers (12.5%)**	**Business Model, Competitive Environment and Technical Positioning - Wireline-only Carriers (12.5%)**	**Regulatory Environment (7.5%)**	**Market Share (7.5%)**	**Revenue Trend and Margin Sustainability (10%)**	**Debt / EBITDA (x)[3] (15%)**	**RCF / Debt (%)[4] (10%)**	**(EBITDA - CAPEX) / Interest Expense (x)[5] (10%)**	**Financial Policy (15%)**
A	$25 - $50	National incumbent provider of full suite of integrated services to a broad customer base wireline and wireless segments exposed to increasing competitive challenges; and moderate international expansion; and low to moderate technology risk. OR Regional provider[2] of full suite of integrated services to a broad customer base with wireline and wireless segments exposed to moderate competitive challenges; and moderate expansion outside of home market with typically about 50% to 60% of sales in one market, country or region; and low to moderate technology risk.	Multi-national operator with successful expansion outside its area, with stable business; and low to moderate technology risk. OR Firmly established national or super-regional operator with stable business; and low to moderate technology risk. OR Emerging operator in developing markets with high growth potential and very low existing competition with less than 50% of sales to one market, country or region; and low to moderate technology risk.	N.A.	Regulatory framework is fully developed, is very predictable and stable in balancing the interests of the incumbent telecom providers and the new comers but with less track-record and is highly supportive of ROI for incumbent telecom providers; and regulatory body is a sovereign, sovereign agency or independent regulator with authority over most telecom regulation that is national in scope; and unlikely awards of new operating concessions.	Company is a very solid competitor in the local market and holds competitive positions in most of the regions where it operates. OR Company is a clear market leader in its local region.	On a sustainable basis: Slight revenue growth AND High margin levels.	1x - 2x	35% - 45%	5x - 6.5x	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	$12.5 - $25	National provider of full suite of integrated services to a fairly broad customer base and substantial competitive challenges; and moderate technology risk. OR Regional provider of full suite of integrated services to a fairly broad customer base and increasing competitive challenges and limited expansion outside of home market with typically about 60% to 80% of sales in one market, country or region; and moderate technology risk.	Multi-national operator expanding in emerging markets with existing competition with less than 70% of sales to one market, country or region and moderate technology risk. OR National operator with strong business; and moderate technology risk. OR Emerging operator in developing markets with high growth potential and low existing competition; and moderate technology risk.	Incumbent exposed to moderate to low competitive challenges; and moderate to low technology risk.	Regulatory framework is fully developed, has a short track-record of being predictable and stable in overall supporting the interests of the incumbent telecom providers while being somewhat more supportive to new entrants, still allowing an adequate ROI for incumbent telecom providers; and regulatory body is a sovereign, sovereign agency or independent regulator with authority over most telecom regulation that is national in scope with change in administration having some potential to alter outlook; and potential awards of limited new operating concessions.	Company is a well-positioned competitor in its local market and holds competitive positions in many regions where it operates. OR Company is a very solid competitor in its local region.	On a sustainable basis: Stable revenues AND Good margin levels.	2x - 2.75x	25% - 35%	3.5x - 5x	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

	SCALE (12.5%)	BUSINESS PROFILE (27.5%)					PROFITABILITY and EFFICIENCY (10%)	LEVERAGE and COVERAGE (35%)			FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (12.5%)	Business Model, Competitive Environment and Technical Positioning - Diversified Carriers (12.5%)	Business Model, Competitive Environment and Technical Positioning - Wireless Carriers (12.5%)	Business Model, Competitive Environment and Technical Positioning - Wireline-only Carriers (12.5%)	Regulatory Environment (7.5%)	Market Share (7.5%)	Revenue Trend and Margin Sustainability (10%)	Debt / EBITDA (x)[3] (15%)	RCF / Debt (%)[4] (10%)	(EBITDA - CAPEX) / Interest Expense (x)[5] (10%)	Financial Policy (15%)
Ba	$5 - $12.5	Regional provider of full suite of integrated services to a narrow customer base with increasing competitive challenges; or typically about 80% to 90% of sales in one market, country or region; or moderate to high technology risk.	National operator with stabilizing business OR Established regional operator with stable business and minimal dependence on roaming or subsidy revenues. OR Emerging operator in developing markets with moderate growth potential or stable performance and moderate existing competition; or typically around 85% of sales to one market, country or region; OR Moderate to high technology risk.	Incumbent with steadily increasing competitive challenges OR Non-incumbent provider with significant end-to-end network infrastructure. Company dependent on access to incumbents' network. OR Moderate to high technology risk.	Regulatory framework is a) well-developed, with evidence of some inconsistency or unpredictability in the way framework has been applied, or framework is new and untested, but based on well-developed and established precedents, or b) jurisdiction has history of independent and transparent regulation in other sectors; or regulatory environment may sometimes be challenging and politically charged; or regulatory support for increased facilities and non-facilities based competition. OR Regulation generally favors new market entrants. OR Likely awards of new operating concessions. OR Regulatory bodies in active deliberations to negatively alter the regulatory framework.	Company is a mid to lower-tier competitor in its local market and holds competitive positions in some of the markets where it operates. OR Company is a well-positioned competitor in its local region.	Expectation of: Slight, sustained decline in revenues OR Sustained moderate margin levels.	2.75x - 3.75x	20% - 25%	2x - 3.5x	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	$2 - $5	Regional provider of full suite of integrated services to a narrow customer base with increasing competitive challenges; or typically more than 90% of sales in one market, country or region; or high technology risk.	National operator with below industry-average performance OR Established regional operator with below average performance. OR Emerging regional operator or established regional operator with deteriorating performance on a sustained basis or typically around 90% of sales to one market, country or region; OR High technology risk.	Incumbent with rapidly declining business (i.e. revenues declining by about 10% per year) OR Non-incumbent based operator with significant core network infrastructure with high dependence on access to incumbents' network. OR High technology risk.	Regulatory framework is developed, but there is a high degree of inconsistency or unpredictability in the way the framework has been applied; or regulatory environment is consistently challenging and politically charged; or there is no consistent track record of independent and transparent regulation. Jurisdiction has a history of difficult or less supportive regulatory decisions, or regulatory authority has been or may be challenged or eroded by political or legislative action.; or regulatory support for non-facilities based competition. OR Regulation strongly favors new market entrants. OR Regulatory change to have strong negative impact on the regulatory framework.	Company is a small competitor in its local market and holds minor competitive positions in other markets. OR Company is a mid to lower-tier competitor in its local region.	Expectation of: Moderate, sustained decline in revenues OR Sustained modest margin levels.	3.75x - 5.5x	10% - 20%	1x - 2x	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 (12.5%)	BUSINESS PROFILE (27.5%)					PROFITABILITY and EFFICIENCY (10%)	LEVERAGE and COVERAGE (35%)			FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (12.5%)	**Business Model, Competitive Environment and Technical Positioning - Diversified Carriers (12.5%)**	**Business Model, Competitive Environment and Technical Positioning - Wireless Carriers (12.5%)**	**Business Model, Competitive Environment and Technical Positioning - Wireline-only Carriers (12.5%)**	**Regulatory Environment (7.5%)**	**Market Share (7.5%)**	**Revenue Trend and Margin Sustainability (10%)**	**Debt / EBITDA (x)[3] (15%)**	**RCF / Debt (%)[4] (10%)**	**(EBITDA - CAPEX) / Interest Expense (x)[5] (10%)**	**Financial Policy (15%)**
Caa	$0.5 - $2	Provider of full suite of integrated services highly dependent on access to incumbent's network; or very high technology risk.	National operator with very poor performance compared to industry average OR Established regional operator with very poor performance. OR Emerging regional operator or established regional operator with meaningful deterioration in performance and no prospects of recovery in the short-term or typically almost 100% of sales to one market, country or region; OR Very high technology risk.	Incumbent with extremely rapidly declining business and margins OR Non-incumbent based operator with poor core network infrastructure With very high dependence on access to incumbents' network. OR Very high technology risk.	Regulatory framework is not developed, is unclear, is undergoing substantial change or has a history of being unpredictable or adverse to telecom operators; or regulatory body lacks a consistent track record or appears unsupportive, uncertain, or highly unpredictable; or may face high risk of significant government intervention in operations or markets; or strong regulatory support for non-facilities based competition. OR Regulation is highly unbalanced towards favoring new market entrants.	Company is a small competitor in its local market.	Expectation of: Strong decline in revenues OR Sustained weak margin levels.	5.5x - 8x	5% - 10%	0.5x - 1x	Expected to have financial policies (including risk and liquidity management) that create a material risk of debt restructuring in varied economic environments
Ca	< $0.5	Provider of full suite of integrated services with very limited access to incumbent's network; or extremely high technology risk; or high probability of disruption in service because of the poor quality of network.	Mobile Virtual Network Operator or affiliate without spectrum. OR Extremely high technology risk.	Competitive entrant reliant on other providers for significant portion of termination OR Reseller. OR Extremely high technology risk.	Regulatory framework or regulatory body carry extremely high risk for the business continuity of telecom operators.	Company is a start-up with no track record.	Expectation of: Steep decline in revenues OR Sustained very weak or extremely unpredictable margin levels.	> 8x	< 5%	< 0.5x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments

[1] For the linear scoring scale, the Aaa endpoint value is $300 billion. A value of $300 billion or better equates to a numeric score of 0.5. The Ca endpoint value is $0.05 billion. A value of $0.05 billion or worse equates to a numeric score of 20.5.
[2] Regional dimension makes reference to geographical footprint in large countries such as the US.
[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 12x. A value of 12x or worse equates to a numeric score of 20.5, as does a negative Debt/EBITDA value.
[4] For the linear scoring scale, the Aaa endpoint value is 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% or worse equates to a numeric score of 20.5.
[5] For the linear scoring scale, the Aaa endpoint value is 20.0x. A value of 20.0x or better equates to a numeric score of 0.5. The Ca endpoint value is -0.50x. A value of -0.50x or worse equates to a numeric score of 20.5.
Source: Moody's Investors Service

Sector overview

Telecommunications service providers make up a broadly diverse group of companies, differentiated by operating history, products and services and customer and service areas. Companies with stronger credit profiles tend to be large diversified carriers that have evolved from historical monopoly providers, or major wireless-only companies with significant financial resources. Speculative-grade issuers typically are smaller, more recent industry participants, which have limited product diversity and are more leveraged, or in some cases operate in countries where ratings are constrained by the sovereign credit. The telecommunications sector frequently undergoes changes mainly due to the emergence of new technologies, intense market competition as well as a high degree of government regulation. The telecommunications industry's roots used to be in government-sanctioned (and in some cases, government-owned) monopolies. Following a worldwide move to deregulate and privatize the dominant national carriers, along with the proliferation of wireless technologies and the global adoption of Internet Protocol (IP) transmissions, intense competition from newer players like cable providers and over-the-top (OTT) providers and growing fragmentation have reshaped the industry.

Telecommunications is a highly capital-intensive industry. The significant investment in network infrastructure for maintenance and the introduction of new services to replace declining legacy products is likely to be a permanent characteristic of all segments of the telecommunications industry, worldwide. Despite the expanding use of telecommunications networks to deliver a broader array of service offerings, telecommunication revenue growth rates are unlikely to deviate from GDP growth levels in the developed markets, while expanding capital spending to elevate the standards of emerging markets will likely hinder free cash flow growth for the global telecommunications industry. Furthermore, increased competition and fast-moving technological trends have generally reduced asset life cycles, with the result that the industry's return on investment has become less certain than it has been historically.

Other typical credit challenges in the industry include consolidation and shareholder activism that pressures companies to re-direct a substantial share of cash flow to equity in the form of dividends, distributions and share buy-backs. While consolidation potentially allows some market players to extract value from scale benefits or to achieve synergies that may ultimately improve financial performance, debt-financed acquisition activity remains a key credit risk in the sector.

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 (12.5% weight)

Why it matters

Size is an important indicator of the overall depth of a company's business and its success in attracting a variety of customers, as well as its resilience to shocks. Size typically drives, among other aspects, the breadth of a company's customer base, the depth of its business, economies of scale, operational and financial flexibility, and greater pricing power. Larger companies may have a greater ability to harness business trends, support a stable or growing market position and withstand competitive pressures. For service providers in the telecommunication industry, scale can enhance a company's ability to bundle products and may be accompanied by market leadership that can bring superior access to customers, which positively influences its long-term business viability.

Scale also typically enhances a company's ability to absorb a temporary disruption, acquisition or misjudgment in the execution of capital investments. Larger companies are generally more broadly diversified, which can help reduce volatility and provide flexibility to generate cash from the divestiture of certain operations, if needed. Larger companies also benefit from greater financial resources as well as access to capital markets, which enhances financial flexibility. These attributes are particularly meaningful in a capital-intensive industry characterized by reduced asset life cycles due to fast-moving technological trends.

How we assess it for the scorecard

REVENUE:

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

Factor: Business Profile (27.5% weight)

Why it matters

A telecommunications company's business profile is important because it greatly influences its ability to generate operating cash flows and the stability and sustainability of those flows. Core aspects of a business profile that drive success or failure typically include the depth and breadth of the company's product offering, its competitive environment and the position it occupies in its operating markets.

This factor has three sub-factors:

Business Model, Competitive Environment and Technical Positioning

A company's business model is an important differentiator in assessing its long-term sustainability, in particular in the telecommunications sector where substantially different business models co-exist or compete, widening the array of credit profiles in the sector. Because convergence has affected many markets, companies with a diversified business model can generally compete more effectively than either a stand-alone fixed-line operation or wireless business, which typically receive lower scores for this sub-factor. A diversified player would typically benefit from a sounder platform for adopting a range of new products, providing it with a stronger capacity to fulfill customers' needs as technologies rapidly evolve. It may also strategically invest in emerging technologies and ramp up investments, depending on market acceptance of these new technologies, widening the opportunity for success.

Beyond broad product differentiation, diversification has other dimensions such as customer segments or geographic reach, both of which can enable a company to mitigate the effects of variation in demand or pricing in a given product or market. Serving a diversity of customers may help to partly offset rapidly evolving trends within the industry. New product categories and customers' needs are constantly emerging, and reliance on any one line or customer segment can carry significant risks. Similarly, geographic diversification may help telecommunication operators, in particular non-incumbent ones, shield from market vagaries, customer switching behavior or technological disruption. However, while international diversification in highly rated countries or in mature and stable markets is typically viewed as beneficial to a company's creditworthiness, investments in lower rated countries or in less developed or predictable telecommunication markets often carry a number of challenges that may offset the benefits of geographic diversification. Those challenges typically come in various forms such as political or regulatory interference, trapped cash, exposure to currency risks or corruption, or diversion of management attention away from the strategies and markets that are core to its business. Hence, a large degree of diversification (especially if debt-financed) into emerging markets, which generally offer the highest growth opportunities but also entail the most risk, can in some cases have a negative credit impact.

The competitive environment typically is a key driver of credit quality because the degree of competition a company faces impacts its pricing power, marketing expenses and customer churn, and hence the sustainability and level of its operating margins. It may also drive the level and pace of capital spending on adopting new technologies, either as a means to differentiate product offerings or reduce costs. The telecommunication sector has been characterized by increasing competitive pressure, in particular for incumbents as regulatory liberalization and technology have created an environment where a host of competitors threaten the value of incumbents' assets.

In that context, and because of the high technology content of the telecommunications industry, the technical positioning of an operator can provide a substantial competitive advantage or conversely weigh on its capacity to retain or expand its customer base. Hence, a company's investment strategy can be critical to its future prospects. For example, we typically view the ownership of a mix of frequencies[2] to be crucial for a mobile operator's business model, in order to handle increasing traffic volume and provide broad geographical coverage across its area of operation. While the cost of adopting new technology may be significant, both in terms of capital required and the risk of failure, the failure to quickly adopt a new technology before competition erodes the incumbent's position may carry some significant business cost.

Regulatory Environment

Due to the essentiality of the product, including demand for high service levels, the public objectives of maintaining fair competition and competitive prices, and the high capital costs associated with its infrastructure, the telecommunications industry is subject to a high degree of government regulation and oversight. As such, the regulatory framework under which a telecommunications company operates is an important determinant of its business profile, primarily because it influences the competitive environment and can help or hinder the company's ability to predictably earn a return on its investment. The balance that regulators in certain regions strike between increasing competition in their markets and protecting employment and price levels in former monopolies has a major impact on business profiles. The potential for new concessions or licenses and the way regulation enables prospective carriers to build new networks, access other carriers' networks, interconnect their networks with incumbents, and obtain "equitable" access pricing can heavily influence the future competitive landscape and operators' financial trajectory. For example, in most mature markets, incumbents have to offer access to these new entrants, but do not have reciprocal access to their competitors' services at regulated prices. Telecommunications operators are often responsible for making investments in high-speed networks but are unlikely to have the exclusivity in exploiting that investment, while some new entrants have asset light businesses and hold dominant positions in their services. Wireless operators can themselves also be impacted by regulatory decisions as additional spectrum sales can increase the overall number of competitors and provide the foundation for the introduction of competing technologies. For services that are price-regulated, the sufficiency and predictability of tariffs have a major influence on cash flows, as regulators seek to balance stabilizing or lowering prices for consumers while allowing companies to earn an adequate return on the investment made in their networks.

Market Share

Market share is important for credit assessment as it can indicate the level of competitive success, the strength of customer relationships, the potential to benefit from operating leverage and likely prospects for future performance. Indeed, the relative positioning of a telecommunications company within its market segments may provide some indication of the sustainability of its operating position and whether it will be able to lead or be required to react to the nature and pace of development in the industry. Furthermore, the strength of a telecommunications company within its markets can influence customer perceptions, its ability to leverage existing capabilities to develop and support revenue, the flexibility to innovate without having to make large bets, and its degree of influence with regulators and government officials. In many cases, the large market share of incumbent service providers, combined with established infrastructure and network coverage, has been a significant advantage.

How we assess it for the scorecard

Scoring for the factor is based on three sub-factors: Business Model, Competitive Environment and Technical Positioning; Regulatory Environment; and Market Share.

BUSINESS MODEL, COMPETITIVE ENVIRONMENT AND TECHNICAL POSITIONING:

The scoring of this sub-factor is based on a qualitative assessment of the market structure, customer count and revenue trends as well as a company's exposure to technological advancement and how well positioned it may be in handling such developments.

Business Model

The key metrics considered for assessing a firm's business model include geographical diversification (i.e., international, national, regional[3]) and revenue mix (i.e., wireless and wireline, voice, data and video (if applicable), business and residential).

Competitive Environment

In assessing the level of competitive challenge we typically consider, among other things, revenue trends, number of players, rate of access line change relative to demand growth and, for wireless carriers, gross additions, churn[4] levels and Average Revenue Per User trends in the company's core markets.

Technical Positioning

We consider how exposed a company may be to technological advancement and how well positioned it may be in handling such developments. Our assessment of a company's technology typically includes an evaluation of the lifetime service capabilities and scalability of the company's existing network architecture. In order to assess the risk associated with a company's ongoing infrastructure plans, we generally consider the technologies that the company is deploying, specifically with regard to whether it is a proven or unproven technology, time to market, the size of the investment required, and the technology's expected lifetime. While this assessment is largely qualitative, a quantitative measure that can be helpful in this evaluation is CAPEX/Revenues, with a higher level typically indicating a lower risk of technology obsolescence. A ratio in the single digit percentage typically would indicate some degree of risk.

There are somewhat different scoring grids for diversified, wireless and wireline carriers, and truncation of the grid on the upper end for the latter two segments of the industry is based on our view that the business models for these entities expose them to greater levels of risk that is inconsistent with the highest scoring levels.

REGULATORY ENVIRONMENT:

The scoring of this sub-factor is based on a qualitative assessment of the regulatory environment in which a telecommunications company operates. We typically consider four different aspects of the regulatory environment as the most useful indicators for assessing this sub-factor: (i) support for return on investment; (ii) regulatory barriers to entry, such as propensity for additional licenses or concessions to be issued; (iii) predictability; and (iv) level of reliance on a regulated revenue stream or service subsidies. If a company relies on regulated revenues that might be at risk due to possible changes in regulation, our perception of business risk increases.

Our assessment of how developed the regulatory framework is typically considers the strength of the political and legal underpinnings of the regulatory framework; the regulator's track record for predictability and stability in terms of decision making; its independence from political interference; and our forward-looking view on whether these conditions will persist. Our assessment would typically be based not only on the relative degree of credit support or challenge a regulatory environment may create for telecommunication operators in a given jurisdiction, but also on how this environment or any change to it may impact a specific issuer. For example, we may consider how the regulatory environment will handle the industry's convergence, and whether regulations tend to favor incumbents or their competitors. We also usually view high reliance on a government-regulated revenue stream negatively. The predictability of the regulatory environment is a key aspect for gauging its credit impact. Regulatory uncertainty generally weighs on all companies in a given jurisdiction.

MARKET SHARE:

The scoring of this sub-factor is based on an assessment of the relative market shares a company exhibits in its different markets/segments of operations.

Factor: Profitability and Efficiency (10% weight)

Why it matters

Profits matter because they are necessary to maintain a business's competitive position, including sufficient reinvestment in marketing, research, facilities and human capital. The breadth of business models and diversity of operating environments in the telecommunications sector (e.g., diversified, wireline, wireless, regional, national, postpaid or prepaid) makes it important to use a multidimensional approach when assessing profitability. While the level and stability of operating margins is a key consideration in assessing risk to debt holders, revenue trends may also drive an operator's capacity to sustain its profitability levels over the medium to long-term. As revenues decline, a company may be able to cut costs to maintain margins on a short-term basis but this may not be achievable indefinitely without putting at risk its business model and thereby its profitability prospects. Conversely, high margins may be supported by strong revenue growth, as can be the case in some emerging markets, but an operator may have little pricing power or cost control to mitigate any impact a slowdown in market dynamics may have on its margins. Hence, the strength of an entity's profitability would typically be a function of both the sustainability of its margins and its revenue trajectory.

How we assess it for the scorecard

REVENUE TREND AND MARGIN SUSTAINABILITY:

The scoring of this sub-factor is based on a forward-looking qualitative assessment of the sustainability in revenue growth and the ability to maintain margins on a sustained basis. Hence, our assessment considers both the level and trajectory of margins and revenues but also their respective sustainability. Typical considerations to assess the sustainability of margin or revenue growth include, among other things, the composition or quality of the margin (for example the degree of the company's operational flexibility and its capacity and willingness to take the necessary steps to maintain or support margin level) as well as the drivers behind revenue growth (e.g., market dynamics or organic growth versus M&A) and the risks attached to those.

Factor: Leverage and Coverage (35% weight)

Why it matters

Leverage and coverage measures provide important indications of a company's financial flexibility and long-term viability. Financial flexibility is critical to respond to changing consumer preferences, regulatory changes, competitive challenges and unexpected events.

This factor has 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.

RCF / Debt

The ratio of retained cash flow to 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-Capex) / Interest Expense

The ratio of EBITDA minus capital expenditures to interest expense ((EBITDA-Capex)/Interest Expense) indicates a company's ability to meet its interest obligations and invest in fixed assets with EBITDA.

How we assess it for the scorecard

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

DEBT / EBITDA:

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

For carriers that offer device leasing,[5] the carrier capitalizes the device cost and recognizes the expense as depreciation over the life of the device lease term.

In such instances, where information is available, we would typically remove the portion of depreciation that relates to device leasing in our calculation of EBITDA, which has the effect of reducing EBITDA. This helps preserve comparability across telecommunications service providers.

RCF / DEBT:

The numerator is retained cash flow (RCF), and the denominator is total debt.

(EBITDA-CAPEX) / INTEREST EXPENSE:

The numerator is EBITDA minus capital expenditures, and the denominator is interest expense.

There is some divergence in reporting practices for spectrum license payments. Some companies classify such spending as plant and equipment and intangible assets; others classify it within acquisitions and investments; while others may display the payment as a separate line-item. Where there is sufficient information available to identify these payments, we typically reclassify them (as a non-standard adjustment) into other investing cash flows. This allocation, still within the investing activities section of the cash flow statement, would remove the expenditure from capex.[6]

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'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[7] is an important aspect of overall risk management and can provide insight into risk tolerance.

Financial policies are very important in the telecommunication sector, which has been characterized by frequent M&A activity. While in-market consolidation can allow market players to extract value from scale benefits, achieve substantial synergies, improve margins and increase cash flows, debt-financed acquisition activity may heighten credit risk, especially when the acquisition increases the company's business risk profile or distract management from the core businesses.

Shareholder pressure is also prevalent in some segments of the telecommunication industry, because established telecommunications companies often have the capacity to generate significant cash flow, even in the face of declining access lines and challenges in revenue growth. Shareholder activism that directs a good portion of the available cash to the equity side can weaken a company's credit profile in an environment of increasing competitive challenges and high capital intensity. This can take the form of dividends, equity recapitalizations, or buybacks that diminish financial flexibility.

How we assess it for the scorecard

The scoring of this sub-factor is based on a qualitative assessment of the issuer's desired capital structure or targeted credit profile as well as adherence to its commitments and ability to achieve its targets. Considerations typically include the management's historical operating performance, management of liquidity, exposure to derivatives or variable rate instruments and hedging strategies as well as use of cash flow through different phases of economic and industry cycles, its response 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 activity is also an important consideration in assessing financial policy. In particular, when considering a company's track record, we would typically review the type of transactions (i.e., core competency or new business) and funding decisions but also their frequency and materiality. For example, a history of debt-financed or credit-transforming acquisitions would typically result in a lower score for this factor.

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

Other considerations

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

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

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in the telecommunications service providers industry. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[8]

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.

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' 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 telecommunications companies, although it may not have a substantial impact in discriminating between two issuers with a similar credit profile. Liquidity can be particularly important for companies in highly seasonal operating environments where working capital needs must be considered, and ratings can be heavily affected by extremely weak liquidity. We form an opinion on likely near-term liquidity requirements from the perspective of both sources and uses of cash. For more details on our approach, please see our liquidity cross-sector methodology.[9]

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, cash on the balance sheet is most often considered qualitatively, by assessing the track-record and the financial and liquidity policy rather than measuring how a point-in-time cash balance would affect a specific metric.

Across all corporate sectors, an important shareholder-focused motivation for cash holdings, sometimes over very long periods, is cash for acquisitions. In these cases, we do not typically consider that netting cash against the issuer's current level of debt is analytically meaningful; however, the cash may be a material mitigant in our scenario analyses of potential acquisitions, share buybacks or special dividends. Tax minimization strategies have at times been another primary motivation for holding large cash balances. Given shareholder pressures to return excess cash holdings, when these motivations for holding excess cash are eliminated, we generally expect that a large portion of excess cash will be used for dividends and share repurchases.

By contrast, some companies maintain large cash holdings for long periods of time in excess of their operating and liquidity needs solely due to conservative financial policies, which provides a stronger indication of an enduring approach that will benefit creditors. For instance, some companies have a policy to routinely pre-fund upcoming required debt payments well in advance of the stated maturity. Such companies may also have clearly stated financial targets based on net debt metrics and a track record of maintaining their financial profile within those targets.

While the scorecard in this methodology uses leverage and coverage ratios with total (or gross) debt rather than net debt, we do consider excess cash holdings in our rating analysis, including in our assessment of the financial and liquidity policy. For issuers where we have clarity into the extent to which cash will remain on the balance sheet and/or be used for creditor-friendly purposes, excess cash may be considered in a more quantitative manner. While we consider excess cash in our credit assessment for ratings, we do not typically adjust the balance sheet debt for any specific amount because this implies greater precision than we think is appropriate for the uncertain future uses of cash. However, when cash holdings are unusually large relative to debt we may refer to debt net of cash, or net of a portion of cash, in our credit analysis and press releases in order to provide additional insight into our qualitative assessment of the credit benefit. Alternatively, creditor-friendly use of cash may be factored into our forward view of metrics, for instance when the cash is expected to be used for debt-repayment. We may also cite rating threshold levels for certain issuers based on net debt ratios, particularly when these issuers have publicly stated financial targets based on net debt metrics.

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

Non-Wholly Owned Subsidiaries

Some companies in the telecommunications sector choose to dilute their equity stake in certain material subsidiaries, for example through an initial public offering, which may in some cases negatively impact future financial flexibility. While improving cash holdings on a one-off basis, selling minority interests in subsidiaries may have a negative impact on cash flows available to the parent company that may not be fully reflected in consolidated financial statements.[10] The parent's share of dividend flows from a non-wholly owned subsidiary is reduced, and minority stakes can increase structural subordination, since dividend flows to minority interest holders are made before the cash flows are available to service debt at the parent company. While less frequent, sale of a minority stake may be accompanied by policies protective of the subsidiary that further limit the parent's financial flexibility, for instance restrictions on cash pooling with other members of the corporate family, limitations on dividends and distributions, or arms-length business requirements. Minority stakeholders may have seats on the board of the subsidiary. In many cases, we consider the impact of non-wholly owned subsidiaries qualitatively.

However, in some cases we may find that an additional view of financial results, such as analyzing cash flows on a proportional consolidation basis, may be very useful to augment our analysis based on consolidated financial statements. When equity dilution or structural subordination arising from non-wholly owned subsidiaries is material and negative, the credit impact is captured in ratings but may not be fully reflected in scorecard-indicated outcomes. For companies that hold material minority interest stakes, consolidated funds from operations typically includes the dividends received from the minority subsidiary, while none of its debt is consolidated. When such dividends are material to the company's cash flows, these cash flows may be subject to interruption if they are required for the minority subsidiary's debt service, capital expenditures or other cash needs. When minority interest dividends are material, we may also find that proportional consolidation or another additional view of financial results is useful to augment our analysis of consolidated financials. We would generally also consider structural subordination in these cases.[11] When these credit considerations are material, their impact is captured in ratings but may not be fully reflected in scorecard-indicated outcomes.

Event Risk

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

Parental Support

Ownership can provide ratings lift for a particular company in the telecommunications 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 typically 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 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.[12] 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,[13] 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,[14] 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[15] 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.[16]

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.[17]

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.[18]

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[19]

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.[20] 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 The wider the spectrum, the more traffic can be carried between mobile sites (the base stations) and mobile phone users. In any given area, the spectrum is allocated between simultaneous users of the network. Low frequencies allow the signal to be distributed over a long distance and penetrate through buildings. These frequencies are typically well suited to the roll out of a broad network coverage at relatively low cost. Conversely, higher frequencies are better suited to providing the capacity necessary to meet demand for high data rates from a large number of users in urban areas, airports and other densely populated or visited locations.

3 Regional dimension makes reference to geographical footprint in large countries such as the US.

4 The churn rate is the percentage of subscribers to a service who discontinue their subscriptions within a given time period.

5 For instance, wireless operators may offer financing options that allow subscribers to buy or lease new smartphones with zero down and installment payments.

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

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

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

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

10 For example, in the case of an equity stake reduction in a subsidiary down to 75%, in the parent's financial statements, all revenue and EBITDA of the subsidiary would typically still be consolidated at the group level.

11 Proportional consolidation brings a portion of the minority subsidiary's debt onto the balance sheet, but this debt is structurally senior to debt at the parent company, because it is closer to the assets and cash flows of the minority subsidiary.

12 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.

13 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.

14 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.

15 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.

16 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.

17 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.

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

19 A link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

20 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 issuer/deal page on https://ratings.moodys.com for the most updated credit rating action information and rating history.

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