MOODY'S
INVESTORS SERVICE

RATING METHODOLOGY
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Rating Methodology

Paper and Forest Products

This rating methodology replaces the *Paper and Forest Products Industry* methodology published in October 2018. 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 We have removed outdated information.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 harvesting and sale of timber or the conversion of virgin or recycled cellulose into products sold as paper packaging, tissue, paper, wood-based building materials or pulp.

Some timberland and wood product companies have legally converted to real estate investment trusts (REITs) and are rated under this methodology rather than under the REITs methodology. To determine which methodology to use, we focus on the fundamentals that drive the credit profile, rather than on the tax election. Companies that file as REITs for tax purposes but that are primarily engaged in the harvesting and sale of timber or manufacture and sale of wood-based building materials are rated under this methodology. Companies that are primarily engaged in real estate activities are rated under the REITs methodology.

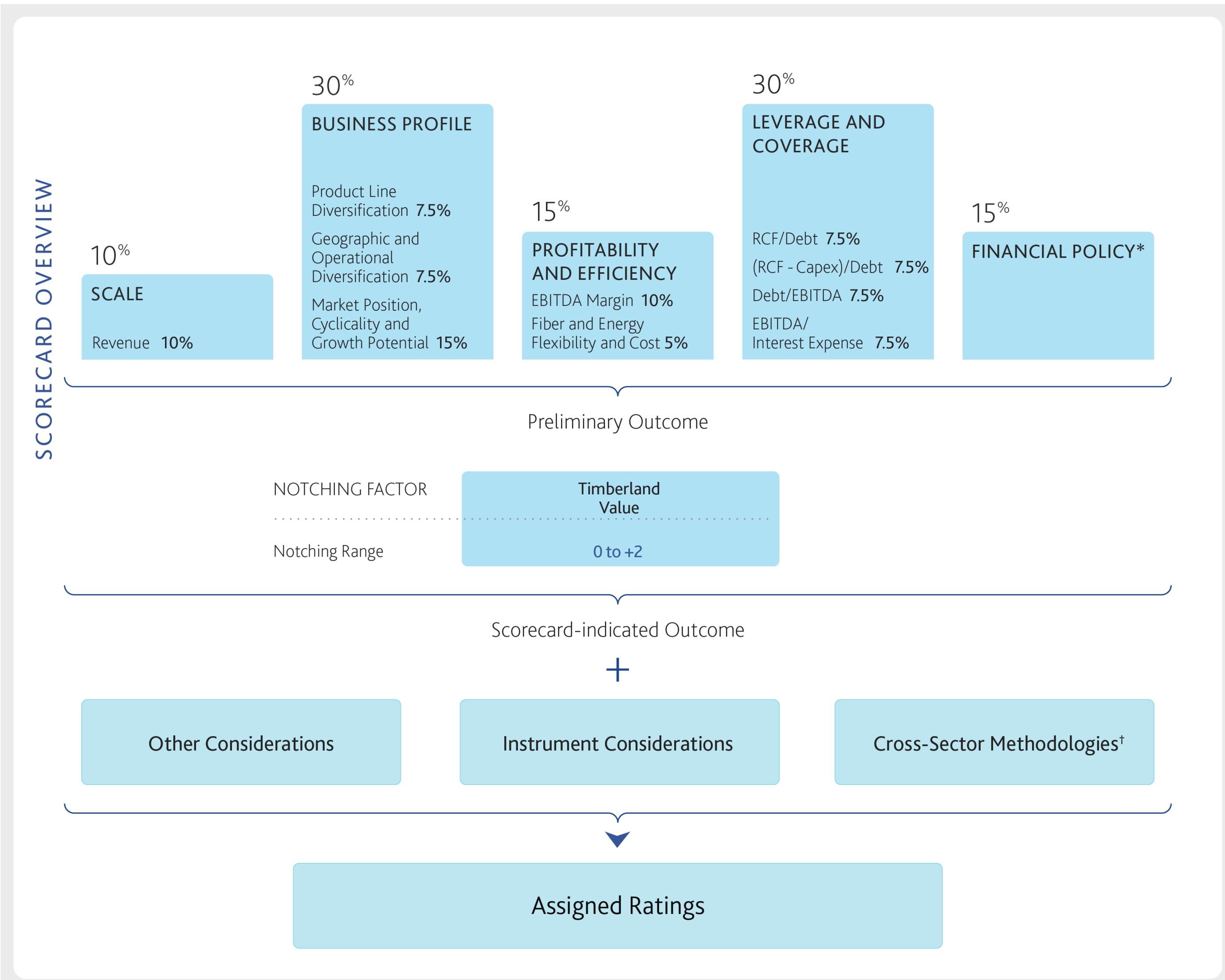
*The determination of a company's primary business is generally based on the preponderance of the company's business risks, which are usually proportionate to the company's revenues, earnings and cash flows.

Rating approach

In this rating methodology, we explain our general approach to assessing credit risk of issuers in the paper and forest products 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 paper and forest products 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 paper and forest products 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

Paper and forest products 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

Paper and forest products scorecard

	SCALE (10%)	BUSINESS PROFILE (30%)			PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (30%)				FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Product Line Diversification (7.5%)	Geographic and Operational Diversification (7.5%)	Market Position, Cyclicality and Growth Potential (15%)	EBITDA Margin[3] (10%)	Fiber and Energy Flexibility and Cost (5%)	RCF / Debt[4] (7.5%)	(RCF - CAPEX) / Debt[5] (7.5%)	Debt / EBITDA[6] (7.5%)	EBITDA / Interest Expense[7] (7.5%)	Financial Policy (15%)
Aaa	≥ $50	Extremely diverse group of product segments and customers; for example, company has ≥ 6 product segments and no customer represents > 5% of revenue.	Exceptional global geographic diversification and operational flexibility. For example, operates mills[2] in at least six regions and multiple mills in all regions.	Exclusive provider of products; extremely high entry barriers; no cyclicality; demand growth expected to significantly outpace capacity additions; not vulnerable to imports; and organic revenue growth expected to significantly exceed nominal GDP growth or population growth on a sustained basis.	≥ 60%	Assured access to fiber supplies from various sources; owns fiber supplier and is able to sell excess fiber to the market; has access to additional economical sources of fiber very close to the mills; total fiber costs are significantly below market rates; energy self-sufficient and sells excess energy to the electric grid at extremely favorable rates; total energy costs are significantly below market rates; and has flexibility to switch among many energy sources.	≥ 60%	≥ 45%	≤ 0.5x	≥ 30x	Expected to have extremely conservative financial policies (including risk and liquidity management); very stable metrics; essentially no event risk that would cause a rating transition; and public commitment to a very strong credit profile over the long term.
Aa	$30 - $50	Highly diverse group of product segments and customers; for example, company has ≥ 5 product segments and no customer represents > 10% of revenue.	Excellent geographic diversification and operational flexibility. For example, operates mills in at least five regions and multiple mills in majority of regions.	Strongly competitive provider of products in highly consolidated industries; leading market position in all product lines; extremely high entry barriers; no cyclicality; demand growth expected to outpace capacity additions; not vulnerable to imports; and organic revenue growth expected to significantly exceed nominal GDP growth or population growth.	45% - 60%	Assured access to fiber supplies; owns fiber supplier and is able to sell excess fiber to the market; fiber source is very close to the mills; total fiber costs are well below market rates; energy self-sufficient and sells excess energy to the electric grid; total energy costs are well below market rates; and has flexibility to switch among several energy sources.	45% - 60%	35% - 45%	0.5x - 1x	20x - 30x	Expected to have very conservative financial policies (including risk and liquidity management); stable metrics; minimal event risk that would cause a rating transition; and public commitment to a strong credit profile over the long term.

	SCALE (10%)	BUSINESS PROFILE (30%)			PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (30%)				FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Product Line Diversification (7.5%)	Geographic and Operational Diversification (7.5%)	Market Position, Cyclicality and Growth Potential (15%)	EBITDA Margin[3] (10%)	Fiber and Energy Flexibility and Cost (5%)	RCF / Debt[4] (7.5%)	(RCF - CAPEX) / Debt[5] (7.5%)	Debt / EBITDA[6] (7.5%)	EBITDA / Interest Expense[7] (7.5%)	Financial Policy (15%)
A	$15 - $30	Well-diversified group of product segments and customers; for example, company has 4 product segments.	Very good geographic diversification and operational flexibility. For example, operates mills in at least four regions and multiple mills in some regions.	Competitive provider of products in consolidated industries; leading market position in most product lines; very high entry barriers; little cyclicality; demand growth expected to outpace capacity additions; not vulnerable to imports; organic revenue growth expected to exceed nominal GDP growth or population growth.	25% - 45%	Very good access to fiber supplies, primarily through long-term contracts; primary fiber suppliers are close to the mills; total fiber costs are below market rates, or company can pass through cost increases; energy self-sufficient; total energy costs are below market rates; has flexibility to switch among several energy sources.	35% - 45%	25% - 35%	1x - 1.75x	12x - 20x	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	$5 - $15	Diverse group of product segments and customers; for example, company has 3 product segments.	Good geographic diversification and operational flexibility. For example, operates mills in at least three regions and more than one mill in at least one region.	Reasonably competitive provider of products in consolidated industries; strong market position in most product lines; high entry barriers; modest cyclicality; demand growth expected to be in line with capacity additions; imports pose limited threat; organic revenue growth expected to be closely in line with nominal GDP growth or population growth.	20% - 25%	Good access to fiber supplies, primarily through long-term contracts; primary fiber suppliers are close to the mills; total fiber costs are low, or company can pass through a significant portion of cost increases; partially energy self-sufficient; total energy costs are below market rates; has flexibility to switch among several energy sources.	20% - 35%	12% - 25%	1.75x - 3x	7x - 12x	Expected to have financial policies (including risk and liquidity management) that balance the interests of creditors and shareholders; some risk that debt-funded acquisitions or shareholder distributions could lead to a weaker credit profile.

	SCALE (10%)	BUSINESS PROFILE (30%)			PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (30%)				FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Product Line Diversification (7.5%)	Geographic and Operational Diversification (7.5%)	Market Position, Cyclicality and Growth Potential (15%)	EBITDA Margin[3] (10%)	Fiber and Energy Flexibility and Cost (5%)	RCF / Debt[4] (7.5%)	(RCF - CAPEX) / Debt[5] (7.5%)	Debt / EBITDA[6] (7.5%)	EBITDA / Interest Expense[7] (7.5%)	Financial Policy (15%)
Ba	$2 - $5	Two product segments with very little customer concentration.	Moderate geographic diversification and operational flexibility. For example, operates mills in at least two regions and more than one mill in at least one region.	Modestly competitive provider of products in fragmented industries; modest market position in most product lines; modest entry barriers; demand and pricing are cyclical; supply growth expected to outpace demand growth; imports pose modest threat; organic revenue growth expected to be below nominal GDP growth or population growth.	15% - 20%	Moderate access to fiber supplies, with a portion of fiber supplied through long-term contracts; fiber supply and pricing are subject to volatility; total energy costs are at market rates; has limited flexibility to switch among energy sources.	10% - 20%	5% - 12%	3x - 4.5x	4x - 7x	Expected to have financial policies (including risk and liquidity management) that tend to favor shareholders over creditors; above-average financial risk resulting from shareholder distributions, acquisitions or other significant capital structure changes.
B	$0.5 - $2	One product segment with little customer concentration.	Some geographic diversification and operational flexibility. For example, operates at least two mills in a single region or operates in two regions but with only one mill in each region.	Weakly competitive provider of products in fragmented industries; weak market position in most product lines; low entry barriers; demand and pricing are cyclical; products mostly compete on price; frequent oversupply and shortage conditions; vulnerable to imports; organic revenue declines expected for most products; high substitution risk; secular decline in demand for some products.	10% - 15%	Fiber supplies are mostly sourced from the open market; fiber supply and pricing are subject to volatility; total energy costs and supply are subject to volatility; energy is sourced primarily from the open market.	5% - 10%	0% - 5%	4.5x - 6x	1.5x - 4x	Expected to have financial policies (including risk and liquidity management) that favor shareholders over creditors; high financial risk resulting from shareholder distributions, acquisitions or other significant capital structure changes.

	SCALE (10%)	BUSINESS PROFILE (30%)			PROFITABILITY and EFFICIENCY (15%)		LEVERAGE and COVERAGE (30%)				FINANCIAL POLICY (15%)
	Revenue (USD Billion)[1] (10%)	Product Line Diversification (7.5%)	Geographic and Operational Diversification (7.5%)	Market Position, Cyclicality and Growth Potential (15%)	EBITDA Margin[3] (10%)	Fiber and Energy Flexibility and Cost (5%)	RCF / Debt[4] (7.5%)	(RCF - CAPEX) / Debt[5] (7.5%)	Debt / EBITDA[6] (7.5%)	EBITDA / Interest Expense[7] (7.5%)	Financial Policy (15%)
Caa	$0.25 - $0.5	One product segment and customer concentration (two to three customers combined represent > 10% of revenue).	Weak geographic diversification or operational flexibility. For example, operates only one mill.	Very weakly competitive provider of products in highly fragmented industries; weak market position in all product lines; low entry barriers; demand and pricing are highly cyclical; products compete on price only; latent overcapacity exists in the region; highly vulnerable to imports; significant organic revenue declines expected for most products; or demand for major products is in secular decline.	5% - 10%	Access to fiber source is curtailed by an extraordinary event (e.g., environmental or legislative); fiber pricing and supply are subject to significant volatility; or primary mills are located in regions with high energy costs.	0% - 5%	0 - (5)%	6x - 9x	0.5x - 1.5x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring in varied economic environments.
Ca	< $0.25	One product segment with significant customer concentration (at least one customer represents > 10% of revenue).	Essentially no geographic diversification or operational flexibility. Operates only one mill that has weak cost efficiency.	Extremely weakly positioned provider of products in highly fragmented industries; extremely weak market position in all product lines; no entry barriers; demand and pricing are highly cyclical; products compete on price only; latent overcapacity exists regionally and globally; highly vulnerable to imports; significant and rapid organic revenue declines expected for most products; or products are expected to be completely replaced in 3-5 years.	< 5%	Access to main fiber source is severely curtailed by an extraordinary event (e.g., environmental or legislative) and no alternative fiber source is available; or primary mills are located in regions with very high energy costs.	< 0%	< (5)%	> 9x	< 0.5x	Expected to have financial policies (including risk and liquidity management) that create elevated risk of debt restructuring even in healthy economic environments.
Notching Factor											
Timberland Value			(Notching Factor)								

[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] We consider the number of primary mills. A primary mill consists of one or more paper machines, pulp lines or wood product facilities. Converting facilities and warehouses are not considered primary mills.
[3] For the linear scoring scale, the Aaa endpoint value is 70%. A value of 70% 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.
[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 -2.5%. A value of -2.5% or worse equates to a numeric score of 20.5.
[5] For the linear scoring scale, the Aaa endpoint value is 55%. A value of 55% or better equates to a numeric score of 0.5. The Ca endpoint value is -10%. A value of -10% or worse equates to a numeric score of 20.5.
[6] For the linear scoring scale, the Aaa endpoint value is zero. A value of zero or better equates to a numeric score of 0.5. The Ca endpoint value is 15x. A value of 15x or worse equates to a numeric score of 20.5, as does a negative Debt/EBITDA value.
[7] For the linear scoring scale, the Aaa endpoint value is 50x. A value of 50x or better equates to a numeric score of 0.5. The Ca endpoint value is zero. A value of zero or worse equates to a numeric score of 20.5, as does negative EBITDA.
Source: Moody's Investors Service

Sector overview

We typically segment the industry into four major sub-sectors: (i) paper packaging and tissue; (ii) paper; (iii) timberlands and wood products; and (iv) market pulp.

Paper packaging includes containerboard used in "brown boxes," folding cartons used in consumer packaging for food (e.g., cereal boxes) and non-food items (e.g., personal care products). Tissue consists primarily of toilet paper, facial tissue and paper towels. Examples of paper products include uncoated freesheet used for photocopiers, brochures, envelopes and forms; coated freesheet used for magazines; newsprint used for newspapers; and specialty paper with unique characteristics (e.g., filter paper or labels).

Logs harvested from timberlands are used to produce wood products, paper, pulp or bio-energy fuels. Wood products, such as lumber, plywood and engineered wood products, are typically consumed in wood-frame construction and home renovations. Hardwood and softwood pulp are used as fiber input to manufacture paper, paper packaging and tissue.

Each sub-sector has distinct business fundamentals, but demand, supply, pricing and the cost base generally drive financial performance for most companies. Demand and prices for tissue and paper packaging have been generally relatively stable, while demand and prices for market pulp and wood products have varied significantly year to year. Demand for most printing and writing grades of paper has experienced secular decline. As companies bring incremental mills online or idle existing mills, the pace of change in operating capacity relative to demand growth typically has led to price volatility. In addition, global and regional economic conditions, as well as foreign exchange fluctuations, can influence the fundamentals significantly.

The sector's price volatility and cyclicality make control of the cost base, especially fiber and energy, which are typically the largest costs for paper and forest products companies, essential to maintaining profitability. Backward integration into fiber and energy generation, as well as forward integration, for example paper packaging companies that convert containerboard into boxes, can generally help companies maintain more control over these costs.

Discussion of the scorecard factors

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

Factor: Scale (10% weight)

Why it matters

Scale can be an important indicator of a company's market leadership, operational flexibility and access to end markets. It can also provide indications of a company's purchasing power and the economics of its logistics. Larger scale often increases a company's importance to the markets it serves and its staying power.

How we assess it for the scorecard

REVENUE:

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

Factor: Business Profile (30% weight)

Why it matters

The business profile of a paper and forest products company provides an important indication of its strength based on several measures of its diversification, its market position, and the cyclicality and growth potential for its products.

PRODUCT LINE DIVERSIFICATION:

Different products in the paper and forest products industry often face varying supply and demand trends, so a company with more segments typically benefits from greater diversification against fluctuation in pricing and end-market demand. For example, prices of some products, such as oriented strand board, can vary dramatically, whereas pricing for paper packaging tends to be relatively stable.

Having more segments also generally provides a company with a broader market footprint with large customers, as well as a greater number of overall customers, reducing its reliance on any one customer. Having a greater number of customers limits a company's vulnerability to shifts in spending of any one customer.

GEOGRAPHIC AND OPERATIONAL DIVERSIFICATION:

Paper and forest products companies typically source a significant amount of fiber from within the geographic vicinity of a mill, so a company with primary mills in a number of geographic locations is likely to be less impacted by issues affecting the fiber source in any one location. For example, the climate, natural catastrophes, insect infestations, regulatory conditions and political risk can all affect fiber availability. A company with more mills also has greater flexibility to manage operational challenges in any one mill, such as equipment failures or labor disputes.

MARKET POSITION, CYCLICALITY AND GROWTH POTENTIAL:

Price volatility can create potentially significant swings in financial metrics and cash flow. A company's market position is important because a market leader is generally less vulnerable to the impact of price and demand fluctuations and has greater influence on the overall trends in supply, which affects pricing. Markets with fewer participants and higher barriers to entry normally experience greater price stability, whereas a fragmented market with lower barriers to entry generally imparts less pricing power to its participants. A market that can be served by imports is also likely subject to greater volatility than one served primarily by domestic providers.

Cyclical markets typically experience greater price volatility and can face significant drops in demand. The overall growth potential of a company's products is also important, because it directly influences the expected revenue growth of the company. Companies that manufacture products with rising demand can increase revenue just by maintaining market share, whereas revenue diminishes for companies with products in secular decline unless they can increase market share. In addition, companies with products in secular decline need to continuously remove capacity or convert equipment to other products to prevent over-supply, which typically leads to lower prices.

How we assess it for the scorecard

Scoring for this factor is based on three sub-factors: Product Line Diversification; Geographic and Operational Diversification; and Market Position, Cyclicality and Growth Potential.

We assign scores for these qualitative sub-factors based on the descriptions in the scorecard. Each has multiple attributes. Due to the diversity of business profiles in this sector, we generally do not expect all the characteristics of a given company to exactly match each of the listed attributes for any single scoring category. We typically assign the sub-factor score based on the alpha category for which the company has the greatest number of characteristics. However, there may be cases in which one characteristic is sufficiently important to a particular company's credit profile that it essentially determines the sub-factor score or has a very large influence on it. For example, we are unlikely to score a company that generates most of its revenue from products that are in secular decline higher than B for the Market Position, Cyclicality and Growth Potential sub-factor, even if the company has leading market positions in most of its product lines and there are high barriers to entry.

PRODUCT LINE DIVERSIFICATION:

We assess the number of distinct product lines, typically counting any segment that contributes at least 10% of revenue as a distinct segment. We generally segment a company into the following six separate product lines: (i) paper-based packaging; (ii) printing and writing papers; (iii) tissue; (iv) market pulp; (v) timber; and (vi) wood-based building products. Some companies also compete in other businesses, such as plastic-based packaging, or real estate development or homebuilding, so it is possible for a company to have more than six segments. The segments listed above do not always match a company's reported segments. A company with more product segments typically has a higher score for this sub-factor than one with fewer product segments.

We also consider customer diversification as indicated by the revenue received from individual customers. A company with revenue heavily concentrated with a single customer typically scores lower for this sub-factor than one with revenue more broadly spread among customers.

GEOGRAPHIC AND OPERATIONAL DIVERSIFICATION:

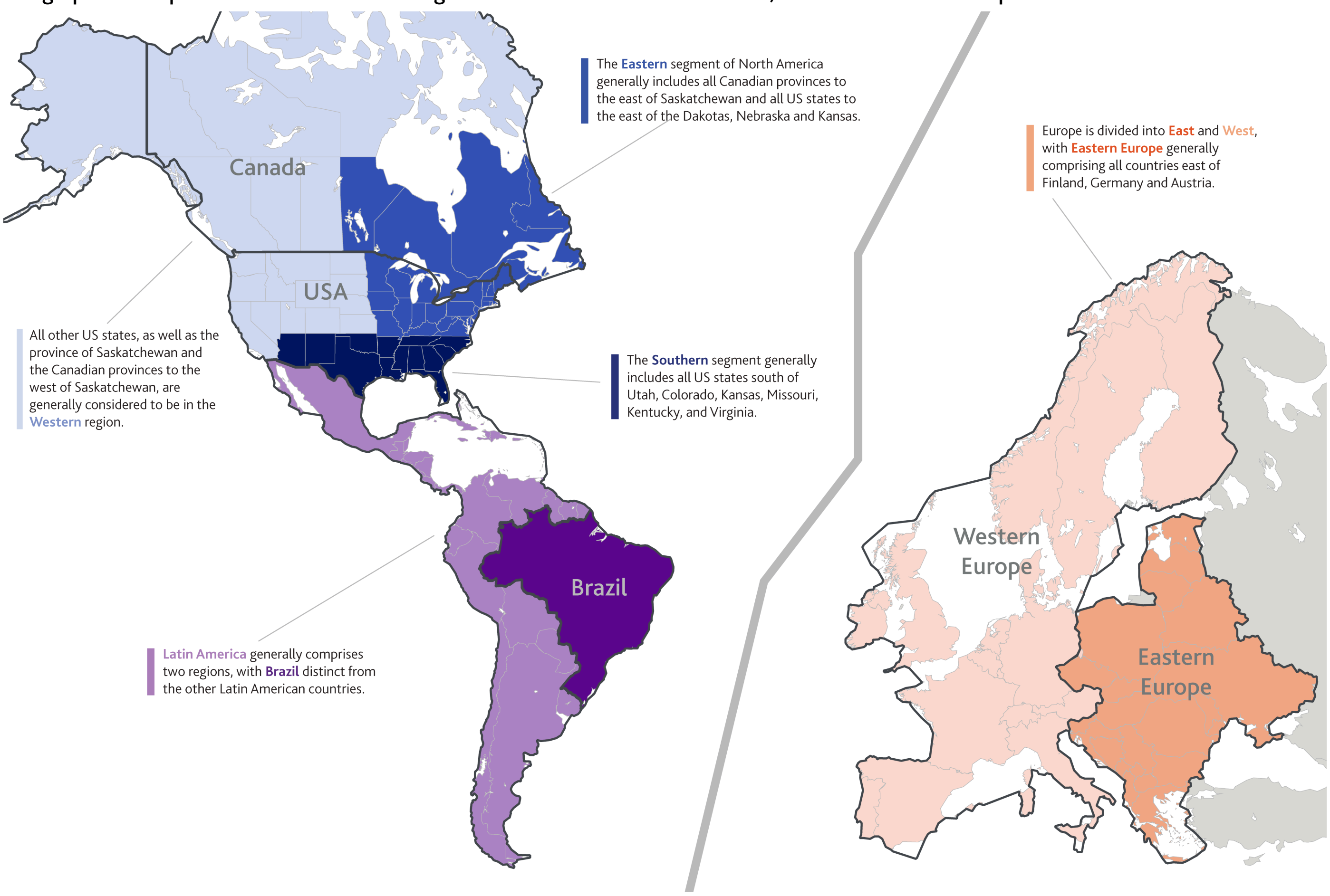
In scoring this factor, we consider the concentration of a company's primary mills in any one geographic region. A primary mill consists of one or more paper machines, pulp lines or wood product facilities. Converting facilities (i.e., box plants that convert paperboard produced at a primary mill into folding boxes) and warehouses are not considered primary mills.

We typically consider North America to be three geographic regions: East, West and South. The Eastern segment generally includes all Canadian provinces to the east of Saskatchewan and all US states to the east of the Dakotas, Nebraska and Kansas. The Southern segment generally includes all states south of Utah, Colorado, Kansas, Missouri, Kentucky, and Virginia. All other states, as well as the province of Saskatchewan and the Canadian provinces to the west of Saskatchewan, are generally considered to be in the Western region. We divide Europe into East and West, with Eastern Europe generally comprising all countries east of Finland, Germany and Austria. Latin America generally comprises two regions, with Brazil distinct from the other Latin American countries. Additional regions include Asia, Australia and New Zealand, and Africa.

Companies that operate mills in more regions typically score higher for this sub-factor than companies with fewer mills. The absolute number of primary mills also plays a role in our assessment.

Exhibit 3

Geographic and operational diversification: regional breakouts for North America, Latin America and Europe



Note: Additional regions include Asia, Australia and New Zealand, and Africa, which are not shown.
Source: Moody's Investors Service

MARKET POSITION, CYCLICALITY AND GROWTH POTENTIAL:

We consider the industry structure for a company's major products and its position within that structure. We typically assess the barriers to entry for the company's key products and its competitive position. A company with a leading position in a product segment served by few alternative providers generally scores higher for this sub-factor than a company that lacks competitive differentiation in a fragmented market with many providers.

We evaluate the likely stability or volatility of demand for a company's key products through economic cycles, and we may assess the expected duration of down cycles. We may consider likely net capacity additions as well as the share of products supplied by imports.

Depending on the business mix, our assessment of the growth potential for a company's products may take into account forecast growth for GDP, population or housing construction activity.

Factor: Profitability and Efficiency (15% weight)

Why it matters

A company's ability to manage its cost structure is an important credit consideration for an industry as cyclical as the paper and forest products industry. A company with strong profitability and operating efficiency can generally withstand economic and cyclical downturns with less impact on its credit metrics and competitive position than a company with weaker profitability and operating efficiency.

This factor comprises two sub-factors.

EBITDA MARGIN:

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

FIBER AND ENERGY FLEXIBILITY AND COST:

Since fiber and energy typically make up the largest cost components in manufacturing paper and forest products, a company's ability to control these costs is a key credit consideration.

Companies in this industry manufacture a variety of products using wood fiber and recycled fiber, which are generally subject to different supply and demand trends. Variability in the cost of fiber and a company's access to it can affect its competitiveness. A company that owns a fiber supplier is likely able to manage its cost base better than one that buys fiber in the open market. Among those that buy fiber on the open market, a company with access from multiple suppliers through long-term contracts generally has lower cost-variability than one without contracts and with fewer suppliers. Some companies have fiber in excess of their own needs and can sell it on the open market, which can boost their profitability. The proximity of the fiber source to the company's mill is also important, because transporting fiber across greater distances can increase costs.

Energy is another major input in the manufacture of paper and forest products, and an ability to switch among alternative fuels provides a company with flexibility to manage energy costs in response to changes in the supply and price of different types of fuel. Some companies generate a portion of their own energy by burning waste, which can decrease net energy costs and provide additional efficiency.

How we assess it for the scorecard

Scoring for this factor is based on two sub-factors: EBITDA Margin; and Fiber and Energy Flexibility and Cost.

EBITDA MARGIN:

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

FIBER AND ENERGY FLEXIBILITY AND COST:

The way we assign scores for this qualitative sub-factor is similar to the way we score sub-factors in the business profile section. Scores for this sub-factor are based on our expectations for a company's access to fiber and energy and its ability to control these input costs in accordance with the descriptions in the scorecard. We do not generally expect all the characteristics of a given company to exactly match each of the listed attributes for any single scoring category. For example, in an environment of rapidly rising energy costs, a company with high energy costs and few alternative sources is likely to score very low for this sub-factor. Conversely, in a period of more-stable energy costs, this characteristic could be less critical to the company's credit profile and could have less influence on this sub-factor score.

We assess a company's access to fiber suppliers, considering, for example, the number and location of the suppliers and the contract structure (if any), as well as whether a company supplies its own fiber and, if so, whether it also sells the fiber on the open market. We may also consider whether a company can pass through some of its fiber costs to customers. Companies with diverse sources of fiber and a strong ability to control costs, whether through vertical integration or long-term contracts, or by passing through costs, typically score higher for this sub-factor than companies with fewer sources of fiber and volatile supplies and pricing.

Our evaluation of a company's energy costs typically considers its sources of energy and those costs in comparison to market rates. Companies that are energy self-sufficient and sell their excess energy typically score highly for this sub-factor. A company with the flexibility to switch between different sources of energy in order to lower its costs or pass through some portion of its energy costs typically scores higher than one reliant on fewer sources without any ability to pass through costs. We may also take into account energy costs in the geographic area of primary mills for companies that source a large portion of their requirements from the open market.

Factor: Leverage and Coverage (30% weight)

Why it matters

Leverage and coverage measures are important indicators for a company's financial flexibility and long-term viability, including its ability to adapt to changes in consumer preferences, regulation and the competitive environment. Companies in the capital-intensive paper and forest products industry generally require financial resources to invest in innovation, product development and environmental compliance, as well as to make strategic acquisitions that expand product lines or to diversify into developing geographic regions. The ratios in this methodology use total (or gross) debt; please also see the discussion of excess cash balances in the "Other considerations" section.

This factor comprises four sub-factors:

RCF / DEBT:

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

(RCF – CAPEX) / DEBT:

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

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.

EBITDA / INTEREST EXPENSE:

The ratio of earnings before interest, taxes, depreciation and amortization to interest expense (EBITDA/Interest Expense) is an indicator of a company's ability to meet its interest obligations.

How we assess it for the scorecard

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

RCF / DEBT:

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

(RCF – CAPEX) / DEBT:

The numerator is RCF less capital expenditures, and the denominator is total debt.

DEBT / EBITDA:

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

EBITDA / INTEREST EXPENSE:

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

Factor: Financial Policy (15% weight)

Why it matters

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

Financial risk tolerance serves as a guidepost to investment and capital allocation. An expectation that management will be committed to sustaining an improved credit profile is often necessary to support an upgrade. For example, we may not upgrade the ratings of a company that has built flexibility within its rating category if we believe the company will use that flexibility to fund a strategic acquisition, cash distribution to shareholders, spin-off or other leveraging transaction. Conversely, a company's credit rating may be better able to withstand a moderate leveraging event if management places a high priority on returning credit metrics to pre-transaction levels and has consistently demonstrated the commitment to do so through prior actions. Liquidity management[2] is an important aspect of overall risk management and can provide insight into risk tolerance.

Many paper and forest products companies have historically used acquisitions to spur revenue growth, expand business lines, consolidate market positions, and advance cost synergies.

How we assess it for the scorecard

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

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

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

Notching factor

Our assessment of the Timberland Value notching factor may result in an upward adjustment to the preliminary outcome that results from the five weighted factors. We apply this adjustment in half-notch increments, with a maximum of two alpha-numeric notches up from the preliminary scorecard-indicated outcome to arrive at the scorecard-indicated outcome. In cases where we consider that the credit weakness or credit strength represented by the notching factor is greater than the scorecard range, we incorporate this view into the rating, which may be different from the scorecard-indicated outcome. For a discussion of scorecard mechanics, please see the "Using the scorecard to arrive at a scorecard-indicated outcome" section.

Why it matters

The potential debt-reduction capability and financial flexibility provided by timberland holdings are important credit considerations for companies that have retained ownership of timberlands. Given that timberland is an asset with a diverse group of owners and potential buyers, we believe ownership of it provides a company with a potential source of liquidity. Companies in this industry have historically sold excess timberland and used a portion of the net proceeds to repay debt.

How we assess it for the scorecard

The value of timberland varies across regions based on a variety factors, including age, species mix, accessibility for logging, development value and end-market opportunities. We estimate the value of the timberland using a variety of approaches. For example, we may haircut recent timberland transactions (often quoted on a dollars per acre basis) or haircut the stated value of the biological assets in the company's financial statements.

After estimating the value of timberland, we divide it by the company's total debt. The result is then rounded to the nearest half-point up to 2.0, and this value is subtracted from the preliminary numeric scorecard-indicated outcome (subtracting from the aggregate numeric score can yield a higher alpha-numeric scorecard-indicated outcome). For example, if we estimate that a company's timberland value is $5.2 billion and that company has $3 billion of total debt, the resulting quotient of approximately 1.73 would be rounded down to 1.5, which we would then subtract from the preliminary numeric scorecard-indicated outcome. This would yield a higher alpha-numeric outcome.

Other considerations

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

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

Regulatory Considerations

Companies in the paper and forest products sector are subject to varying degrees of regulatory oversight, including environmental standards, notably in the area of carbon emissions (please also see the "Environmental, Social and Governance Considerations" section). 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 and environmental considerations can also play a role in our assessment of a company's business profile and its profitability and efficiency. For example, shifting customer preferences in response to environmental concerns could influence demand for particular products (either positively or negatively) and therefore may play a role in our scoring of the Market Position, Cyclicality and Growth Potential sub-factor. The cost of energy and a company's access to it are typically an important part of our assessment for the Fiber and Energy Flexibility and Cost sub-factor. In some circumstances, regulatory considerations may also be a rating factor outside the scorecard, for instance when regulatory change is swift.

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of issuers in the paper and forest products industry. For information about our approach to assessing ESG issues, please see our methodology that describes our general principles for assessing these risks.[3]

A significant portion of paper and paper-packaging that is manufactured is recycled or re-used, but some ends up as waste and must be sent to a landfill. Regulations on waste disposal may vary geographically, making the location of a company's mills important. Many companies have been investing in technology to reduce environmental impacts (e.g., biomass cogeneration systems, wastewater treatment facilities, and investments to reduce fiber/water usage and increase energy efficiency), which may increase costs or capital expenditure requirements. Natural or human-caused disasters that could disrupt operations, reduce the supply of wood fiber or create legal liabilities also pose risk.

For issuers in this sector, we also consider social issues that could materially affect the likelihood of default and severity of loss, for example through adverse impacts on business reputation, brand strength and employee relations.

Audit committee financial expertise, the incentives created by executive compensation packages, related-party transactions, interactions with outside auditors, and ownership structure are among the areas we may consider in our assessment of how corporate governance affects an issuer's credit profile.

Financial Controls

We rely on the accuracy of audited financial statements to assign and monitor ratings in this sector. The quality of financial statements may be influenced by internal controls, including the proper tone at the top, centralized operations, and consistency in accounting policies and procedures. Auditors' reports on the effectiveness of internal controls, auditors' comments in financial reports and unusual restatements of financial statements or delays in regulatory filings may indicate weaknesses in internal controls.

Management Strategy

The quality of management is an important factor supporting a company's credit strength. Assessing the execution of business plans over time can be helpful in assessing management's business strategies, policies and philosophies and in evaluating management performance relative to 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.

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 company operates. Some companies have very predictable cash needs and others have much broader intra-period swings; for instance, related to mark-to-market collateral requirements under hedging instruments. Some companies may hold large levels of cash at times because they operate without committed, long-term bank borrowing facilities. Some companies may hold cash on the balance sheet to meet long-term contractual liabilities, whereas other companies with the same types of liabilities have deposited cash into trust accounts that are off balance sheet. The level of cash that issuers are willing to hold can also vary over time based on the cost of borrowing and macroeconomic conditions. The same issuer may place a high value on cash holdings in a major recession or financial crisis but seek to pare cash when inflation is high. As a result, cash on the balance sheet is most often considered qualitatively, by assessing the issuer's track record and financial and liquidity policies rather than by measuring how a point-in-time cash balance would affect a specific metric.

Across all corporate sectors, an important shareholder-focused motivation for cash holdings, sometimes over very long periods, is cash for acquisitions. In these cases, we do not typically consider that netting cash against the company'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 companies where we have clarity into the extent to which cash will remain on the balance sheet and/or be used for creditor-friendly purposes, excess cash may be considered in a more quantitative manner. While we consider excess cash in our credit assessment for ratings, we do not typically adjust the balance sheet debt for any specific amount because this implies greater precision than we think is appropriate for the uncertain future uses of cash. However, when cash holdings are unusually large relative to debt, we may refer to debt net of cash, or net of a portion of cash, in our credit analysis and press releases in order to provide additional insight into our qualitative assessment of the credit benefit. Alternatively, creditor-friendly use of cash may be factored into our forward view of metrics, for instance when the cash is expected to be used for debt repayment. We may also cite rating threshold levels for certain issuers based on net debt ratios, particularly when these issuers have publicly stated financial targets based on net debt metrics.

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

Liquidity

Liquidity is an important rating consideration for all paper and forest products 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 or cyclical 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.[4]

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 natural disasters 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.

Non-wholly Owned Subsidiaries

Some companies in the paper and forest products sector have policies that include diluting a company's equity stake in 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.[5] The parent's share of dividend flows from a non-wholly owned subsidiary are 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.[6] When these credit considerations are material, their impact is captured in ratings but may not be fully reflected in scorecard-indicated outcomes.

Parental Support

Ownership can provide ratings lift for a particular company in the paper and forest products sector if it is owned by a highly rated owner(s) and is viewed to be of strategic importance to those owners. In our analysis of parental support, we consider whether the parent has the financial capacity and strategic incentives to provide support to the issuer in times of stress or financial need (e.g., a major capital investment or advantaged 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.[7] For example, price controls, onerous taxation and high distributions can have a negative effect on an issuer's underlying credit profile.

Other Institutional Support

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

Seasonality

Seasonality can be a concern for some paper and forest products companies. Higher volatility creates less room for errors in product or operational execution. Increased lumber orders for the spring homebuilding and construction season often require companies to carry excess log inventories. Sawmills need to take log delivery in the winter when the ground is still frozen, before the spring break-up from warmer and wetter weather restricts log transportation from the forest to the mill.

Cyclical Sectors

Scorecard-indicated outcomes in cyclical sectors may be higher than the rating at the top of the economic cycle and lower than the rating at the bottom of the cycle. While using last-12-month financials in the scorecard typically provides very useful insights into recent or near-term results, ratings may also reflect our expectations for the progression of yearly results over a longer period that may include a full economic cycle. However, cyclicality itself poses many different types of risks to companies, and cycles do not reverse themselves with predictable regularity. A cyclical sector may also be affected by a secular decline or expansion. These considerations may be incorporated qualitatively in ratings.

Using the scorecard to arrive at a scorecard-indicated outcome

1. Measurement or estimation of factors in the scorecard

In the "Discussion of the scorecard factors" section, we explain our analytical approach for scoring each scorecard factor or sub-factor,[8] 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,[9] 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[10] 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 4

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 5

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 weighted 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 preliminary outcome). We then consider whether the preliminary outcome that results from the weighted factors should be notched upward,[11] based on the Timberland Value factor, in order to arrive at an overall numeric score. The overall numeric score is then mapped back to a scorecard-indicated outcome based on the ranges in the table below. For example, an issuer with an aggregate numeric score of 11.7 would have a Ba2 scorecard-indicated outcome.

Exhibit 6

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

In general, the scorecard-indicated outcome is oriented to the corporate family rating (CFR) for speculative-grade issuers and to the senior unsecured rating for investment-grade issuers. For issuers that benefit from rating uplift from parental support, government ownership or other institutional support, we consider the underlying credit strength or Baseline Credit Assessment for comparison to the scorecard-indicated outcome. For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers.[12]

Assigning issuer-level and instrument-level ratings

After considering the scorecard-indicated outcome, other considerations and relevant cross-sector methodologies, we typically assign a CFR to speculative-grade issuers or a senior unsecured rating for investment-grade issuers. For issuers that benefit from rating uplift from government ownership, we may assign a Baseline Credit Assessment.[13]

Individual debt instrument ratings may be notched up or down from the CFR or the senior unsecured rating to reflect our assessment of differences in expected loss related to an instrument's seniority level and collateral. The documents that provide broad guidance for such notching decisions are the rating methodology on loss given default for speculative-grade non-financial companies, the methodology for notching corporate instrument ratings based on differences in security and priority of claim, and the methodology for assigning short-term ratings.[14]

Key rating assumptions

For information about key rating assumptions that apply to methodologies generally, please see *Rating Symbols and Definitions*.[15]

Limitations

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

Limitations of the scorecard

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

The scorecard in this rating methodology is a relatively simple 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.[16] Examples of such considerations include the following: how sovereign credit quality affects non-sovereign issuers, the assessment of credit support from other entities, the relative ranking of different classes of debt and hybrid securities, and the assignment of short-term ratings.

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

General limitations of the methodology

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

Ratings reflect our expectations for an issuer's future performance; however, as the forward horizon lengthens, uncertainty increases and the utility of precise estimates, as scorecard inputs or in other considerations, typically diminishes. Our forward-looking opinions are based on assumptions that may prove, in hindsight, to have been incorrect. Reasons for this could include unanticipated changes in any of the following: the macroeconomic environment, general financial market conditions, industry competition, disruptive technology, or regulatory and legal actions. In any case, predicting the future is subject to substantial uncertainty.

Moody's related publications

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

For data summarizing the historical robustness and predictive power of credit ratings, please click here.

For further information, please refer to *Rating Symbols and Definitions*, which is available here.

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

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Endnotes

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

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

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

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

5 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.

6 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.

7 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.

8 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.

9 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.

10 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.

11 Overall, a notching factor directly adjusts the alphanumeric-equivalent of the preliminary score. The meaning of an upward whole notch is that it raises in all cases the alphanumeric-equivalent of the preliminary score by one alphanumeric category (e.g., from B2 to B1). Numerically, an upward whole notch subtracts 1.0 from the preliminary score. The meaning of an upward half-notch is that it raises the alphanumeric-equivalent of the preliminary score by one alphanumeric category only if the preliminary score is strong within its category; if the preliminary score is weak within its category, an upward half-notch will not change the alphanumeric-equivalent. Numerically, an upward half-notch subtracts 0.5 from the preliminary score.

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

13 For an explanation of the Baseline Credit Assessment, please refer to *Rating Symbols and Definitions* and to our cross-sector methodology for government-related issuers. A link to a list of our sector and cross-sector methodologies and a link to *Rating Symbols and Definitions* can be found in the "Moody's related publications" section.

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

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

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

This publication does not announce a credit rating action. For any credit ratings referenced in this publication, please see the ratings tab on the issuer/entity page on www.moodys.com for the most updated credit rating action information and rating history.

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