MOODY'S
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RATING METHODOLOGY

Wireless Tower Securitizations Methodology

This rating methodology replaces *Moody's Approach to Rating Securities Backed by Wireless Towers* published in November 2019. The methodology's title and table of contents have been revised. We have also made limited editorial updates to improve readability, and we have added a footnote for further transparency on our approach to monitoring transactions. The updates do not change the substantive approach of the methodology.

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Scope

In this methodology, we explain our global approach to assessing credit risks for wireless communications site ("wireless tower") securitizations, including quantitative and qualitative factors that are likely to affect rating outcomes in this sector. Wireless communications sites may include, but are not limited to, macro tower sites (as described in Appendix B), indoor and outdoor distributed network systems (DNS) that may include distributed antenna system (DAS) and/or small cells, and any other wireless communication equipment.

We discuss the asset and liability analysis, including associated modeling, as well as other considerations. We also describe our monitoring approach.

Rating Approach

In our portfolio analysis, we assess the likely levels and stability of the net cash flows generated by the towers over the life of the securitization. That assessment is based primarily on the following factors:

» Contractual terms of the leases currently in the pool.

» Types and locations of the towers.

» Diversification of wireless technologies represented in the pool.

» Future demand and likelihood of development of competing technologies.

» Management of the tower and the pool of leases.

» Expenses of the transaction.

Our structural analysis incorporates our portfolio analysis of the receivables, depending on the structure of the securitization. Our analysis focuses on the ratio of the principal of the bond (and all other bonds in the structure that are at least as senior as that bond) to the present value of the expected net cash flows. In determining our final rating, we may supplement the main quantitative analysis with additional sensitivity analyses and subjective adjustments for factors such as pool concentrations, structural idiosyncrasies, bond amortization profile, and legal and operational risks, including the legal form of security interest which the issuer has in the towers.

The results of our quantitative modeling are important inputs to our rating committee process. The ratings a rating committee assigns also incorporate a variety of qualitative factors and may differ from a model output.

Asset Analysis and Related Modeling

Our portfolio analysis focuses on the net cash flows – i.e., revenue minus expenses – that will be generated by the assets over a long period of time, typically 25 to 30 years. We analyze each component separately.

Revenue Influencing Factors

Owners of wireless towers rent space to tenants to install various types of wireless technology equipment, which include, but are not limited to, equipment to support the following services:

» Cell phones and smartphones.

» Land and specialized mobile radio (used primarily by government agencies, such as police, and dispatch services.)

» Paging and data services.

» Transmission of radio and television signals.[1]

The revenue generated by a pool of wireless towers primarily depends on the following factors.

1 See Appendix A for a description of the different types of services supported by wireless tower equipment.

Terms of the Current Lease Pool

Our analysis starts with the current revenue generated by the pool of existing leases. In assessing its potential future revenue, we examine the extent to which the leases have provisions that automatically increase rates on a periodic basis, the maturity terms of the leases and the likelihood of renewal.

Tower Type, Height and Location

There are a variety of tower types, which differ in size and capacity for rental. (See Appendix B for a description of the different types of towers). In addition, a tower's transmission coverage range – and hence its value to some tenants – depends on its height and location. Consequently, in our portfolio analysis, we consider the types, heights and locations of the towers in the securitization pool in analyzing the continuing revenue-generating ability of the towers.

Potential Changes in Mix of Technologies

The percentage of revenue generated by different wireless technologies changes over time as some technologies decline and eventually become obsolete while other technologies experience growth. Our analysis includes an assessment of the historical trends and potential for future growth for each technology.

Future Wireless Services Demand and Tower Supply

The future demand for wireless services and the supply of wireless towers affects both the lease rates that the manager can obtain and the capacity utilization of each tower. We assess the factors that could affect future demand, such as the expansion of new competing technologies and developments in the understanding of the health risks posed by exposure to electromagnetic waves. We also examine the potential supply of new wireless towers, which is affected by industry profitability, zoning regulations, and public sentiment toward new tower construction.

Management of Towers and Leases

The revenue-producing potential of a pool of towers depends on the ability of the manager to effectively manage the towers. Under wireless tower leases, the manager typically is responsible for the following:

» Ensuring unfettered access to the site for tenants.

» Ensuring that the operations of any new tenants do not interfere with existing tenants' equipment.

» Providing a well-managed site with an uninterrupted supply of power and other necessary utilities.

Consequently, our portfolio analysis includes an assessment of the historical record of the manager in managing pools of towers and any factors that may lead to a change in that ability throughout the life of the transaction.

The revenue produced by a pool of leases also depends, in part, on the effectiveness of the manager in utilizing tower capacity. Thus, our analysis examines the ability of the manager to manage a pool of lease assets, subject to economic and industry conditions.

Defaults by Lessees

The revenue generated by leases on wireless towers depends, in part, on the extent to which lessees default. Our analysis includes an assessment of the likelihood of default based on the lessees' ratings or credit estimates.[2,3] We use static recovery assumptions following a lessee default which reflect the necessity of wireless services for customers.

Factors Influencing Expenses

The cash flows available to investors is equal to the revenue generated by the leases minus the expenses of the transaction. Those expenses include operating expenses, capital expenditures and the management fee. We analyze potential future operating expenses and capital expenditures based on industry experience and the manager's historical performance, as well as factors – such as inflation – that could alter those expenses in the future. In assessing the management fee, we examine not only the fee specified in the operating documents (which is usually specified as a percentage of revenues), but also the extent to which the specified fee is likely to attract a capable replacement manager in the event it is necessary to replace the original manager.

Structural Analysis and Liability Modeling

For both amortizing and non-amortizing structures,[4] we use the portfolio analysis to generate probability distributions of the important factors that affect net cash flows. The factors that we simulate typically include revenue growth (by type of tenant), operating expenses, maintenance capital expenditures, and the default of the tenants. We then simulate all of the factors multiple times to determine the transaction's expected net cash flows, based on our assumptions regarding revenues (which includes the effects of tenant defaults) and expenses.

We may also apply fixed stresses to some variables throughout the simulations, representing specific stress scenarios, such as a merger between particular lessees. We then calculate the present value of the expected net cash flows.

We use the present value to calculate the "cumulative loan-to-value" (CLTV) ratio for each rated tranche, where "cumulative loan" refers to the aggregate size of the tranche and all of the more senior tranches, and "value" refers to the present value of the expected net cash flows. We then obtain a model output by comparing the tranche's CLTV to ranges of CLTV's that we deem to be consistent with each Moody's rating. In Exhibit 1, for example, we show indicative CLTV ranges for various rating categories.

EXHIBIT 1

Indicative Relationship Between CLTV Ranges and Ratings for Wireless Tower Securitizations

Ratings	CLTV Range
Aaa	35% - 46%
Aa2	43% - 53%
A2	51% - 60%
Baa2	59% - 65%
Ba2	71% - 75%
Ba3 and Below	> 76%

Source: Moody's Investors Service

2 We apply our cross-sector methodology on using credit estimates. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

3 If a lessee does not have a rating or credit estimate, we assume a likelihood of default consistent with a low speculative-grade rating.

4 In a non-amortizing wireless tower structure, investors receive interest only until the specified Anticipated Repayment Date (ARD), at which time cash flows in excess of interest and expenses is used to pay down the bond. In an amortizing wireless tower structure, amortization begins immediately after issuance.

Our approach accounts for the risk and uncertainty of the cash flows in two ways. First, the CLTV ranges provide for different equity cushions at the different rating levels. Second, we account for the risk of the cash flows, across all rating levels, by discounting the cash flows at rates above the rates on the bonds.[5]

Other Considerations

Additional Factors

We may assign a rating that is either higher or lower than that indicated by our CLTV ranges depending on factors such as the specifics of the capital structure and allocation mechanisms, the concentration of obligors, and the bond tenor. In addition, the actual bond ratings assigned by the rating committee to any wireless tower securitization typically include consideration of numerous other factors, including:

» The sensitivity of the results to certain assumptions, such as assuming the default of one or more (large) tenants.

» The quality and stability of servicing.

» The risk of disruption in the transaction's cash flows that could result from the non-performance of a third party (operational risk).

» Counterparty risk.

» The legal structure of the transaction (see below).

» The legal security on the assets.

Legal Analysis

We analyze the legal aspects of each transaction prior to closing. This analysis typically focuses on the extent to which the assets are insulated from the possible claims of the sponsor's creditors in a bankruptcy of the sponsor. To achieve that goal, wireless tower securitizations typically establish a bankruptcy-remote special purpose entity that either owns the assets (indirectly via subsidiaries) or holds a lien on the assets. Those assets usually include the wireless towers, real property and associated rights, managed and leased third-party towers, rights to current and future tenant leases, owned equipment on towers or at sites and Federal Communications Commission (FCC) licenses.

We also examine the legal form of the security interest which the issuer has in the wireless towers and other assets. The issuer may benefit from a mortgage lien on the wireless towers, which would allow noteholders to foreclose directly on the wireless tower sites upon an event of default. Alternatively, the issuer may pledge the equity interest of the entities which own the towers. Noteholders' primary remedy in this structure is to foreclose on the equity interest granted to them. We believe that the level of protection provided by a mortgage lien is somewhat stronger and may adjust the maximum CLTV for a given rating level accordingly.

In addition, we examine the extent to which our assumptions regarding asset quality and transaction structure are appropriately reflected in the transaction documentation. As part of the legal analysis, we also review legal opinions to ensure that they adequately address any concerns regarding the assignment of the

[5] Typically, we simulate a range of present values using a range of discount rates; we then calculate the weighted average of those present values to use in the CLTV calculation. The weights are the frequencies of the discount rates implicit in an assumed probability distribution. For example, we may assume that the discount rate has a triangular distribution, with a minimum of 8.5%, a mode of 10%, and a maximum of 13%.

assets to the special purpose vehicle (SPV), bankruptcy remoteness of the SPV, or other jurisdiction-specific issues.

We also assess the extent to which a transaction may be subject to environmental liability. Our assessment incorporates the information in desktop environmental reviews that are typically included in transaction documents as well as in any Phase I environmental studies that are conducted on suspect sites. We also evaluate the extent to which any environmental reserve funds and insurance coverage mitigate environmental liability risk. Furthermore, we examine the effectiveness of the procedures and policies in the securitization designed to ensure that the tower portfolio complies with zoning and permitting requirements, including regulations issued by the Federal Aviation Administration and the FCC.

Monitoring

We generally apply the key components of the approach described in this report when monitoring transactions, except for those elements of the methodology that could be less relevant over time, such as originator assessment or the structural and legal analysis.

When monitoring the performance of outstanding ABS, we track the performance of the underlying leases, ratings and developments regarding the manager, the tenants, and other participants in the transaction, the amount and form of credit enhancement and factors that affect the integrity of the legal structure.

The starting points are typically the ratings of key transaction participants and monitoring of the cash flows performance relative to our initial expectations and transaction-specific early amortization triggers. If any of these credit metrics have changed compared to our assumptions, we run a cash flow model to determine the net present value of the cell tower lease payments, and the CLTV of each class of bonds.[6]

We also take into account any material changes in the industry that could impact future performance, including wireless service demand trends and technological developments, among other possible considerations.

[6] For example, in methodologies where models are used, modeling is not relevant when it is determined that (1) a transaction is still revolving and performance has not changed from expectations, or (2) all tranches are at the highest achievable ratings and performance is at or better than expected performance, or (3) key model inputs are viewed as not having materially changed to the extent it would change outputs since the previous time a model was run, or (4) no new relevant information is available such that a model cannot be run in order to inform the rating, or (5) our analysis is limited to asset coverage ratios for transactions with undercollateralized tranches, or (6) a transaction has few remaining performing assets.

Appendix A: Technology Services Supported by Wireless Towers

Wireless Data/Telephony

Wireless data/telephony functions are those normally found in cell phones and smartphone devices: call transmission and reception, voicemail, text messaging and data transmission. This has been a high-growth market globally, particularly in emerging counties where deploying cheaper wireless infrastructure is more economical than building a capital-intensive landline network.

The trend toward mobile computing, integration of wireless services with Wi-Fi networks, and the growing need for bandwidth has increased the demand for lease space on towers.

Land Mobile Radio and Specialized Mobile Radio (LMR/SMR)

LMR/SMR services are used primarily by government agencies (such as the police) and dispatch services (such as taxis and transport companies) for conveying and transmitting brief messages over personalized and secure networks. Over time, as cellular coverage increases, LMR/SMR services will become obsolete and revenue from this segment will disappear.

Paging and Data Services

Paging and data services have become increasingly obsolete as cellular phones have become more prevalent. Paging devices are still used by medical and first-responder personnel because of their broad coverage, in-building penetration and low cost. Over time, as cellular coverage increases, revenues from this segment will also disappear.

Broadcasting

Broadcasting refers to the transmission of television and radio signals. The percentage of households in the United States that get their entertainment programming from broadcast signals will gradually decline as streaming, broadband cable, Internet and satellite services continue to gain popularity. However, over the long term, broadcasting will remain necessary to account for over-the-air television and radio transmission demand.

Appendix B: Types of Wireless Towers

The vast majority of wireless towers can be grouped into four broad categories: guyed, lattice, monopole, and rooftop. A wireless service provider tenant selects a category based on the broadcast transmission coverage it needs and the nature of the geographic terrain it has to service – the higher the tower, the greater the range. With appropriate maintenance, wireless towers have a useful life of 30 to 40 years, depending on climate conditions.

Guyed Towers

Range from 200 to 2,000 feet in height and are supported by cables attached at different levels on the tower with anchor-to-anchor foundations. They can accommodate equipment for up to 30 tenants.

Lattice Towers

Range from 150 to 400 feet in height and are self-supporting, with three or four legs that act as anchors. They can accommodate equipment for up to 12 tenants.

Monopole Towers

Range from 50 to 200 feet in height and are self-supporting vertical tubular structures. They can accommodate equipment for up to six tenants.

Rooftop Sites

These sites are usually located on top of high-rises. Based on the large surface area available on rooftops, the sites can accommodate many tenants.

Appendix C: Some Structural Features of a Typical Wireless Tower Securitization

Debt Service Coverage Ratio (DSCR) Triggers

Triggers that capture excess cash in specified reserve accounts or that rapidly amortize the notes if the debt service coverage ratio (DSCR) falls below predetermined levels can protect investors if performance deteriorates. DSCR is typically defined as the annualized net cash flows for the towers divided by the amount of interest, servicing fees and trustee fees due to be paid over the succeeding twelve months.

Property Release

Transactions generally allow a sponsor to repurchase towers from the portfolio upon payment of a cash release price, generally between 115% and 125% of the allocated loan amount for the property, provided that the DSCR does not deteriorate following the removal. Release price payments reduce the outstanding principal on the notes.

Property Substitution

Transactions generally allow a sponsor to substitute towers under certain conditions, including:

» Up to a specific limit, typically expressed in terms of number of towers per year.

» The combined percentage of wireless data/telephony and investment-grade tenants for the replacement towers must be the same or higher than before the substitution.

» The new towers' ground leases for real estate that is not owned must have an unexpired term at least as long as the towers being replaced.

» The weighted average remaining term of tenant leases on the replacement towers must be the same or longer.

» The maintenance capital expenditures for the replacement towers must not be materially higher than for the replaced towers.

Issuance of Additional Notes

Transactions may include an option to issue additional notes under specific conditions, often including the condition that Moody's will not downgrade, withdraw or qualify its outstanding ratings on the existing notes solely as a result of the additional issuance.

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 includes a discussion of Moody's Idealized Probabilities of Default and Expected Losses, and is available here.

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