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RATING METHODOLOGY

Equipment Lease and Loan Securitizations Methodology

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This rating methodology replaces *Moody's Approach to Rating ABS Backed by Equipment Leases and Loans* published in December 2020. We adjusted our approach for unrated obligors to determine individual asset default probabilities in concentrated pools, introduced a revised pool size section, added an appendix to describe the credit analysis of mixed pools, refined the excess spread analysis in US and Canadian equipment securitizations backed by granular pools, and made limited editorial updates.

Scope

This rating methodology applies to securities backed by equipment leases and loans.

In this methodology, we explain our global approach to assessing credit risks for equipment lease and loan securitizations, including quantitative and qualitative factors that are likely to affect rating outcomes in this sector. The collateral backing these asset-backed securities (ABS) includes leases and loans secured by small, medium, or large-ticket equipment, such as office, machine tool, medical, communications, computer, bank card processing, transportation, agricultural, and construction equipment. Originators are finance companies owned and supported by equipment manufacturers, independent finance companies or commercial banks, or their affiliates. The leases can be finance leases or operating leases.

This methodology does not typically cover leases and loans backed by railcar and shipping container equipment nor aircraft-related leases unless they are part of a diversified pool of equipment leases. This approach typically covers loans backed by aircraft or aircraft-related 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 this section, we describe the key characteristics of the assets and transaction structure, and we summarize our approach to assessing credit risks for securities backed by equipment leases and loans, including quantitative and qualitative factors that are likely to affect rating outcomes in this sector.

The general analytical framework this methodology describes applies to various types of equipment-backed transactions; we choose the appropriate technique to derive the pool loss distribution based on the level of diversification in the asset pools and the type and amount of data available. This methodology also describes the additional analysis we conduct to address the specific risks posed by leases as opposed to loans.

In some cases, these "equipment-backed" transactions include non-equipment-backed leases and loans such as those backed by real estate and autos.[1] We refer to those transactions as "multi-pool" lease transactions.

Key Risks

Portfolio Credit Quality

A risk in equipment-backed transactions is the risk that the underlying obligors default. To assess that risk and the likely amount of loss in the event of default, we analyze the credit quality of the leases and loans, based either on individual asset characteristics or the average characteristics of sets of assets, depending on the data available. Important characteristics for equipment leases and loans include the credit quality of the obligors, equipment type, the ratio of the amount financed to the equipment value, and the terms, seasoning, industrial sectors, and geographic regions of the assets. In assessing the potential impact of those variables, we include an assessment of the current and future macroeconomic environment, the historical performance of pools with similar characteristics, concentrations of the assets, and the underwriting, servicing policies, and capability of the originator and servicer.

In addition, for equipment lease transactions that include residual values as part of the transaction collateral, we assess the potential residual value loss that could arise if the leased asset is turned in when the lease ends and sold for less than the base residual value.

Transaction Structure

The risk to each class of investors depends on how the transaction allocates cash flows from the assets, credit enhancement, and hedging vehicles among the various participants in the transaction, as well as how it allocates asset losses. The risks also depend on how triggers in the transaction change those allocations. We typically use a cash flow model to simulate the effects of a transaction's particular structure on each class of rated securities. In addition, we assess the extent to which the transaction structure allows for the addition of assets to the pool after closing, which adds uncertainty and risk to the pool's credit quality.

Analysis Overview

Our rating analysis of equipment-backed securitizations includes both quantitative and qualitative elements. The main drivers of our quantitative analysis are our projections of the future losses on the underlying assets, which depend on the asset default rate and the recovery rate on assets that default. Typically, we project the probabilities of various pool default rates over the life of the transaction, summarized in a "probability distribution" of asset default rates, with a separate analysis of recoveries. In some cases, data on defaults and recoveries are not available separately but are combined in a single asset

1 For our approach to rating securities backed by granular pools of auto loans and auto leases, a link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

loss measure. In those cases, our analysis focuses on projecting the probabilities of future scenarios of that asset loss measure.

We use a model of the transaction's structure to calculate the cash flows that investors would receive in the different scenarios and weight any shortfalls in investor cash flows by the probability of occurrence from the calculated probability distribution. That is, we base our rating on the expected loss to investors.

The specific approach we take to determine the probabilities of the asset default scenarios depends largely on the data available and the diversification and granularity of the pool. For example, when a transaction has a well-diversified pool, and we have sufficient historical performance data on similar pools, we typically use a statistical probability distribution, such as the lognormal, to derive the pool's defaults – what we refer to as the "pool approach." The probability distribution reflects our projections of the pool's expected default rate and its variance, which are based on historical data and which we adjust for differences in pool characteristics.

Alternately, when we have loan-level data on individual assets in the pool, and particularly when the pool has significant concentrations,[2] we might derive a pool-specific probability distribution from the simulated loss behavior of the individual assets. The default behaviors are based on (1) individual asset default probabilities that we adjust for the specific asset's characteristics and (2) correlations among the assets, which we refer to as the "individual asset approach." In some cases, we might approximate the distribution resulting from the simulated loss behavior of the individual assets with probability distributions such as a normal inverse (or large homogeneous portfolio approximation). We might choose to do so only in cases in which the approximation gives close results to the distribution resulting from the simulation. When both types of data are available, we might use both approaches to validate our analysis.

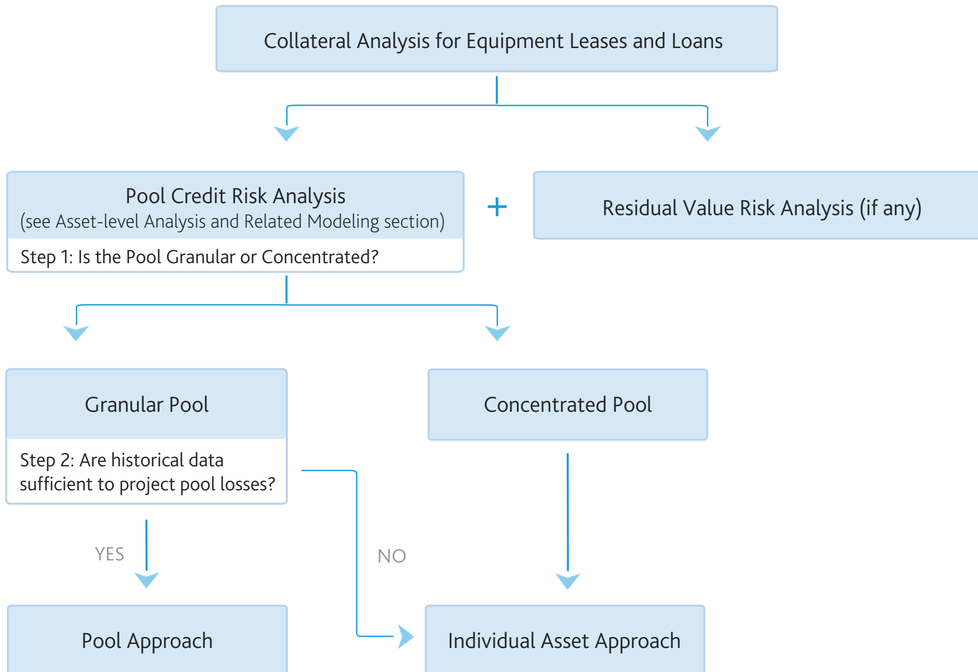
For lease transactions that include residual values as part of the collateral backing the securitization, we conduct a second type of quantitative analysis whereby we assess the risk that the realized residual values will be less than the value set on the residuals at the outset of the securitization (i.e., the "base" value of the residuals). The base value is often the net book value of the equipment. That residual value risk depends on the proportion of residual value in the pool, the originator's historical residual value realization rates, the consistency of those rates over time, the applicability of those data to the pool being securitized, and the rating being considered.

The model outputs derived by our quantitative modeling are important considerations in our rating committee process. However, the ratings assigned by a rating committee incorporate a variety of qualitative factors, including the result of sensitivity analyses to default and recovery assumptions, and ratings may differ from the model output.

[2] For more information, see Appendix 1

EXHIBIT 1

Alternative Methods to Analyze Collateral in Equipment-backed Transactions



Source: Moody's Investors Service

The collateral of certain equipment-backed transactions may be analyzed using a combination of the Pool Approach and the Individual Asset Approach, as described in Appendix 2.

Asset-level Analysis and Related Modeling

In this section, we explain how we analyze the underlying assets that back equipment lease and loan securitizations and how we estimate potential losses on those assets.

Probability Distribution of Asset Defaults or Losses

We typically use one or more approaches to derive the probability distribution of asset defaults or losses for the securitized pool.

For pools with a large number of well-diversified assets that are all roughly the same size (i.e., for granular pools) on which we receive sufficient relevant historical performance data, we typically use the "pool" approach, in which we assume that the default or loss distribution is consistent with a particular family of statistical distributions, such as lognormal. We specify the specific distribution in that family by projecting the pool's expected loss and variability. We can measure variability by the variance of the asset loss distribution or by its coefficient of variation. A granular pool ensures that the random default of any single credit will not have a material and detrimental impact on the overall pool; therefore, determining the credit quality of each credit is not necessary.

When we have sufficient historical performance data on similar pools from the originator or similar originators, we often base our projections of the expected value and variability on those data, adjusted for factors that can drive differing behavior in the future.[3] In many cases, though, we bypass a direct estimate of variability and instead infer the variability of asset losses from (a) our pool loss estimate and (b) the level of credit enhancement that a rating committee would deem consistent with a Aaa (sf) rating (or the highest achievable rating in a country when the country's local currency ceiling, is below Aaa) for a security backed by the given asset pool. We may refer to this as the "Aaa level" of credit enhancement or portfolio credit enhancement.[4]

Alternatively, when individual asset data are available or when pools are not granular, we typically use a Monte Carlo simulation to simulate the individual assets' default behavior, based on asset-specific characteristics and assumed correlations among the assets. This "individual asset" approach is particularly useful when:

» we do not have sufficient historical performance data of similar pools on which to base projections for the pool being securitized, and/or

» the pool has significant asset concentrations – including disproportionately large individual assets, regional concentrations, and industry concentrations – that make it subject to idiosyncratic loss-performance behavior unlikely to be reliably predicted based on the experience of historical pools.[5]

In this individual asset approach, we obtain a pool-specific distribution of defaults from the simulated default behavior. We typically use that full distribution as an input in our transaction cash flow analysis, together with projections for recoveries on defaulted assets. However, if approximations with a normal inverse are close to those we obtain with the simulated distribution, we might choose to input the approximated distribution in the cash flow model instead. We can also use the mean and variance of the simulated default distribution as an alternative to, and a reality check on, historical data we used in our analysis.

In some cases, when there are only a few disproportionately large obligors, we may apply specific assumptions on defaults of those obligors and use a pool approach on the remaining assets (mixed pool approach, see Appendix 2).

Pool Approach to Default or Loss Projections

Expected Default Rate Projections Using Historical Data

To project the pool's expected asset default rate using historical data, we typically start by calculating a "base case" default rate from the extrapolation of historical data and then apply adjustments for a variety of factors.

HISTORICAL DATA ANALYSIS

Originators typically provide data either in the form of a single measure of net losses or as two separate components: gross defaults and recoveries. In the latter case, we analyze the two components separately and derive a cumulative default projection and a recovery rate, together with a recovery timing schedule. In some transactions, the legal structure influences the recovery assumption. For example, we give no value to recoveries, when in a Japanese transaction, defaulted loans are paid in kind to subordinated securities. When default and recovery data are separate, the analysis typically applies to defaults.[6]

The data that originators provide cover either (a) an evolving, dynamic portfolio of assets over time, sometimes the originator's entire portfolio of managed assets, or (b) particular sets of assets originated

3 For more information, see the "Historical Data Analysis" section.

4 For more information, see the "Inferring Variability from Expected Losses and Credit Enhancement Levels" section.

5 For more information, see Appendix 1.

6 For our analysis of recoveries, see the "Recovery Rate Analysis" section.

during a common period such as vintage or static pool data. In many cases, the static pool data are from the pools of assets backing prior securitizations.

Since static pool data derive from a fixed pool of assets over their lives, those data are more directly applicable than portfolio data for projecting the potential losses for a new pool of assets over its life. When we need to rely on portfolio data information instead of static pool data to project losses for the securitized pool, we adjust our assumptions to account for factors such as (a) portfolio growth, (b) a mixture of credit quality in the overall portfolio resulting from changes in underwriting standards over time and (c) timing mismatches between defaults and recoveries. However, even with those adjustments, portfolio loss numbers are often difficult to interpret.

DATA EXTRAPOLATION

In theory, static pool information gives us a set of historical cumulative defaults or net losses on pools comparable to the pool being securitized, allowing us to derive estimates of the expected default or net loss rate of the pool and its variability. In practice, often only some, if any, of an originator's prior static pools have gone through their entire life cycle. However, even for incomplete pools, data will still contain useful information on likely lifetime defaults. To use such data in our analysis of lifetime asset defaults, we extrapolate losses to date on the incomplete pool for the remainder of the pool's life.[7]

DATA FROM OTHER ORIGINATORS

In many cases, we supplement our analysis of the originator's data with data from comparable originators. In some cases, the originator's static pool data could be limited, either because the originator is relatively new to the market or has not tracked static pool performance. In other cases, an originator's static pool data may not be completely relevant to the pool of leases and/or loans being securitized, either because of recent changes in the originator's origination, underwriting and servicing policies and strategies or because of our expectation that the macroeconomic environment will differ materially from the environment represented in the historical performance data. However, the precision of the loss and variability estimates typically will be lower the more we need to rely on data from other issuers. We typically would account for that increased risk by incorporating more variability in the Aaa level of credit enhancement (or portfolio credit enhancement).

Base Case Expected Loss

To derive a base case expected loss, we typically average the extrapolated cumulative losses of the analyzed pools, applying weights to the pools based on how comparable they are to the pool being securitized. If we extrapolate the default data, we average the extrapolated cumulative default rates and derive an expected default rate. We incorporate the recovery rate assumption in a second step. We might disregard a pool entirely if, for example, it is very dissimilar from the pool being securitized or if the data are insufficient to reliably determine a trend. We then adjust the base case for performance trends, differences in pool composition, seasoning of the loans, changes in origination and servicing practices, and potential changes in the macroeconomic environment.

BASE CASE ADJUSTMENT FOR POOL COMPOSITION

A variety of credit characteristics of the assets in the pool can influence the pool's future performance, among them, the following:

» loan or lease characteristics such as the amount financed to equipment value ratios, original terms, the implicit yield for leases or interest rate for loans, the form of amortization[8]

[7] For more information, see Appendix 3.

[8] For more information, see Appendix 5.

» types and manufacturers of equipment

» obligor characteristics: geographical and obligor concentrations, external or internal credit scores, debt service coverage ratios

When historical pools have materially different credit characteristics from the securitized pool, we adjust the projections from the historical data to account for those differences. The adjustments can be subjective or, when we have stratified data (i.e., information on the performance of the historical pools for sets of loans with specific characteristics), we can use quantitative methods to adjust historical data to better reflect the pool we are analyzing. Originators typically provide stratified data based on any of the important credit characteristics described above. To use the stratified data, we disaggregate the pool being analyzed in a manner consistent with the stratified historical data and then project the losses for the securitized pool based on the historical performance of similar disaggregated assets.

CONTRACT SEASONING ADJUSTMENTS

The seasoning impact depends on the shape of the loss timing curve relative to the amortization rate of the financings. Seasoning tends to reduce the expected loss for pools with front-ended losses and slow payment rates.

PERFORMANCE TREND ADJUSTMENTS

If the recent loss performance is different from the long-term performance, we analyze the reasons for the difference to determine whether the recent performance is an aberration. We typically give more weight to trends that persist for a prolonged period and that reflect a large sample of assets. If we determine that a recent trend is likely to continue, we rely on data from that period as the most relevant. We also adjust our view of recent loss performance based on delinquency data, which often indicate performance trends that the loss data do not yet reflect.

ORIGINATOR AND SERVICER ADJUSTMENTS

As part of our analysis, we evaluate the originator's quality and consistency in originating and underwriting the leases and loans. The evaluation gives us confidence about both the historical data and the credit quality of the assets in the pool we are analyzing. In our assessment, we analyze changes in policy and strategy that might cause the assets' performance to differ from that of the historical pools. In addition, we examine the originator's incentives to originate and underwrite high-credit-quality assets and the ability of the servicer to collect on the leases and loans and to mitigate losses.

In projecting defaults or losses on the assets, we evaluate the quality of the servicer's collections, work-out and liquidation practices, the servicer's ability to remarket and sell equipment returned at the end of its lease term, and its data processing and reporting systems. Our assessment is typically based on a quantitative analysis of past servicing results, a subjective assessment of the servicer's management, including incentives and motivation for quality performance, and an evaluation of any recent changes in resources that might cause future results to differ from past results. We use that assessment to determine adjustments to the historical performance of the originator's static pools and overall portfolio in making projections on the pool's loss rate.

ADJUSTMENTS FOR POTENTIAL MACROECONOMIC CHANGES

The historical data that we analyze are, in part, a product of their macroeconomic environment. Therefore, if we expect macroeconomic conditions to change materially, we will adjust our projection of the expected loss accordingly. Our expectations are typically based on the projections of our macroeconomic outlooks, although, on occasion, we also look at alternate sources. We focus on macroeconomic variables that we consider important performance drivers for equipment leases and loans such as, (a) the country's GDP growth rate, (b) corporate default rates, and (c) when available and relevant equipment values. For regions with more volatile macroeconomic environments, such as Latin America, the adjustments to historical observation could be significant.

Variability of Defaults or Losses

We typically use one of two comparable methods to assess the variability of defaults or losses.

INFERRING VARIABILITY FROM EXPECTED LOSSES AND CREDIT ENHANCEMENT LEVELS

In this first approach, we determine the variability of the loss estimate indirectly. We can apply this approach to asset defaults instead of losses if we assume a fixed recovery rate. In situations where there is a sufficiently large set of comparable rated transactions in the country or in comparable countries, we generally infer an estimate of the pool loss variability from (1) our expected loss estimate and (2) the level of credit enhancement that the rating committee would deem consistent with the highest rating achievable in a particular country[9] for a security with a simple cash flow structure - such as a simple senior/subordinate capital structure with a sequential waterfall, - backed by the given pool (i.e., the "portfolio credit enhancement"). That level of credit enhancement is derived from (1) credit enhancement levels of the existing, comparable transactions in the country (or in comparable countries), and (2) adjustments made to account for differences between the given pool and the comparable transactions in the factors affecting variability. We use that portfolio credit enhancement level to infer the standard deviation of the loss distribution, as described later. For a given pool loss estimate, the higher the portfolio credit enhancement, the higher the implicit standard deviation of the loss distribution.

VARIABILITY CALCULATION FROM HISTORICAL DATA

An alternative approach is to directly calculate the standard deviation or the coefficient of variation of the observed cumulative loss rates and adjust it usually upward, where necessary, to better reflect the factors that are likely to cause variability over a long-run horizon. The adjustment factors are described in the next section. As a further check, rating committees typically benchmark that variability and the resulting portfolio credit enhancement with that of other similar transactions.

Given that the portfolio credit enhancement is typically considered by rating committees in both approaches, the direct and the indirect methods are comparable and contribute to the loss distribution assumption.

POOL LOSS VARIABILITY

The variability of a pool's defaults or losses depends on a variety of factors,[10] including the:

» expected level of defaults or losses

» quantity, quality, and relevance of historical performance data

» experience and track record of the originator

» stability of servicing

» pool characteristics, including asset concentrations with respect to asset size, equipment type, industries in which the equipment is used, equipment vendors, and obligors tied to particular franchises.

STRUCTURAL FEATURES' IMPACT ON VARIABILITY

In transactions with prefunding or revolving periods that allow for the addition of receivables during the life of the transaction, the potential for changes in pool composition increases the uncertainty of a securitized

9 Transaction ratings are subject to our local currency country risk ceiling in a particular country. For more information, see Appendix 7.

10 For more information on how we assess these factors, see Appendix 4.

pool's loss estimate. As a result, having these features can lead to a higher variability estimate than would otherwise be the case. The increase in variability depends on the transaction's limitations, if any, on adding assets and on the inherent turnover rate of the pool's assets. Alternatively, when modeling the transaction structure using a comprehensive cash flow model, we might model the revolving period using separate assumptions for the initial and the replenished pools.

Several factors mitigate the increase in variability resulting from such features: (1) a long track record of consistent originations, (2) the originator's representation that there will be no adverse selection of additional receivables, and (3) stringent eligibility criteria in the transaction documents for the characteristics of the additional receivables.

Individual Asset Approach to Default or Loss Projections

Mean Asset Default Rate Calculation with Individual Asset Data

When the available historical data are limited or insufficiently representative of the securitized pool, or when pools have material borrower or industry concentrations,[11] we use individual asset data to assess the probability of default for each asset. We then use those individual asset probabilities to simulate the default behavior of each of the assets and aggregate across the pool to calculate a pool-specific probability distribution of defaults. The mean default rate and standard deviation of the distribution we obtain with the Monte Carlo simulations take into account all specific concentrations and individual asset characteristics.

Basic Approach to Individual Asset Default Probabilities ("Top-Down Approach")

Some equipment-backed transactions have limited historical pool data as well as a pool of well-diversified assets for which we have data on some key characteristics of the individual assets but no individual credit assessments on each asset. In these situations, we estimate the individual asset probability of default. We start with an assumed country-specific long-term default probability for the typical equipment-backed asset in the country and then adjust that default probability up or down based on the individual asset-specific characteristics. We use the adjusted default probability, the weighted average life (WAL) of the asset, and our Idealized Default Rates[12] to infer the probability of default for the individual asset. We refer to this approach as the "top-down approach."[13]

Alternative Approaches to Individual Asset Default Probabilities

In situations when a pool contains large obligor exposures that, because of their disproportionate size, result in a concentrated asset pool, we apply different measures of credit quality for individual obligors from which we can infer default probabilities by using the Idealized Default Rate table.

- **Moody's rating**: When we have a published or unpublished, monitored rating on the obligor, we infer the default probability directly from the Idealized Default Rate table.

When obligors do not have a Moody's rating, we use any of the following measures:

- **Credit estimates**: We may consider credit estimates (which also include credit estimates that are derived from the rating of a related entity)[14].

[11] For more information, see Appendix 1.

[12] For more information, see *Rating Symbols and Definitions*. A link can be found in the "Moody's Related Publications" section.

[13] For more information on the top-down approach and the methodology we use to analyse transactions backed by SME pools, a link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

[14] For more information, see our cross-sector methodology that discusses credit estimates. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

- **Credit scoring systems**: We may review such scoring systems and adjust any related mapping as we deem necessary.[15]
- **Structured credit assessments**: We may consider structured credit assessments (SCAs).[16]
- **RiskCalc-based default probabilities**: We may derive a default probability for US corporate firms from Moody's Analytics RiskCalc™ (RiskCalc)[17].
- **Conservative default probability inputs**: If at transaction closing, the obligor data is insufficient to derive an individual credit assessment for a small portion of the pool based on the above individual measures, we may use a conservative default probability assumption consistent with a B2 to Caa2 rating range for such unrated obligors as long as the portion of the pool with no individual credit assessment represents less than 15% of the pool balance (the "initial maximum allowable threshold"). This further assumes that: (1) relevant through-the-cycle portfolio performance data is available for the entire pool, and (2) most loans/leases are backed by large equipment considered essential to the lessees and with a strong expected recovery in case of asset repossession. If these conditions are not met, then the percentage of unrated obligors with no individual assessment for which we may use a conservative default probability assumption is limited to 10% of the pool balance at closing.

During the life of the transaction, the concentration percentage of unrated obligors with no individual assessment in the collateral pool may increase beyond the initial maximum allowed threshold (i.e., 15% or 10% as appropriate) of the outstanding pool balance. In that case, we assume a stressed default probability equivalent to Caa3 for the performing obligors above the specified initial maximum threshold (and may also test the sensitivity to a lower recovery rate).

If the concentration percentage of unrated obligors with no individual assessment comes to exceed 25% of the pool balance (the "maximum allowable threshold") during the transaction life and this exceedance is not cured within 90 days, we would not maintain the ratings due to our inability to reliably assess the credit risk of the pool.

In addition, to limit the risk of reaching the maximum allowable threshold during the life of a transaction due to an inability to update certain individual measures of asset credit quality over time, Moody's will typically not assign a rating where a single obligor represents more than 5% of the pool balance at closing unless such obligor has a Moody's rating, a credit estimate or an SCA.

Individual Asset Framework Variability

When we use a Monte Carlo simulation to derive a pool-specific distribution, the variability of the distribution (measured either by the standard deviation or the coefficient of variation) depends on the extent to which the individual asset sizes are homogeneous, the default probabilities of the individual assets and the correlations among the assets. In our simulation analysis, we use the actual sizes of the assets and calculate the default probabilities of the individual assets using the approach we describe in the "Individual Asset Approach to Default or Loss Projections" section. To account for correlations among the assets, we make assumptions based on whether the assets are (a) in the same industry group, (b) in the same country, or (c) part of an industry that is highly concentrated in the pool.[18] For more granular pools, for which we normally approximate the Monte Carlo simulation distribution with a normal-inverse default distribution, we use the standard deviation, the coefficient of variation, or the implied asset correlation of the

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15 For more information, see our methodology to rating SME balance sheet securitizations. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

16 For more information, see *Rating Symbols and Definitions*. A link can be found in the "Moody's Related Publications" section.

17 For more information, see our methodology to rating collateralized loan obligations. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

18 For example, for a portfolio of equipment leases/loans similar to SME loans, we use the correlation framework we describe in the methodology we use to rate SME loan-backed transactions. A link to a list of sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

distribution we obtain from the Monte Carlo simulation to benchmark the pool's variability against those of past pools. The distribution's variability affects the weight we place in each default scenario when we calculate the transaction's expected loss.

Recovery Rate Analysis

For transactions with separate data on defaults and recoveries, we derive a recovery rate estimate for the securitized pool from the historical recovery data, which we adjust for the potential variability of the expected case. The level of stress typically depends on the target rating for the equipment-backed securities.

In addition, we analyze the influence of the legal framework and structural features on the recovery value, particularly in the event of an originator or servicer default.

Equipment Type Influences on Recoveries

We determine the expected recovery rate by focusing on the historical experience of the most similar assets and then make adjustments for material differences in attributes that can result in a different future performance. [19] Two particularly important factors for recoveries in equipment-backed transactions are the types of underlying equipment (e.g., equipment with very specialized uses or those subject to rapid technological obsolescence tend to have lower recovery rates) and the ability of the lessor or lender to remarket (i.e., re-sell or re-lease) equipment that has been taken back under defaulted leases or loans.

Our recovery rate assumption on small-ticket lease receivables is usually low given the limited secondary market value of most small-ticket equipment. In some small-ticket equipment-backed transactions, originators provide only net loss data, not separate data on defaults and recoveries; as a result, we do not make an explicit recovery rate assumption. Recoveries for medium-sized and large equipment-backed transactions tend to be higher as a percentage of the defaulted amount. If we receive detailed information on large equipment, namely very detailed equipment description, underwriting, and financing details and/or valuation information, including third-party valuations, we may use all this information to derive their recovery rate. Large equipment includes, for example, industrial and manufacturing equipment as well as large transportation equipment.

Impact of Default Definition and Recovery Lag

The definition of default used in a particular jurisdiction or for a particular asset type can influence the typical recovery rate. For example, recovery rates tend to be higher for assets written off at an earlier delinquency stage because these assets are more likely to cure on their own. Even if the defaults do not cure on their own, servicers are more inclined to renegotiate these contracts – and thus get the obligor to voluntarily repay the existing balance – than those at a later stage of delinquency.

Recovery rates are influenced by the lag between default and recovery: the longer the delay in recovery, the greater the asset depreciation. We use historical data to project the recovery timing, which depends, in part, on the servicer's operational efficiency. Furthermore, country-specific factors such as the typical length of insolvency proceedings influence the country-specific lag between an asset default and recovery realization.

Loss of Recoveries upon Originator Default

We also consider that in some jurisdictions, if the lessor becomes bankrupt, the transaction's special purpose entity may lose the rights to the cash flows from equipment that is resold or re-leased after an asset default. In those cases, we adjust our expected recovery rates accordingly. When no rating or credit estimate is available for the originator, we may assume a conservative default rate consistent with that of a Caa-rated originator. We calculate two recovery rates for each asset default scenario, one in which the

[19] For our analysis of the recovery rates on multi-pool leases collateralized in part by real estate, see Appendix 9.

originator defaults and one in which it does not. The level we assume in the case of originator default is low and rarely exceeds 30%, accounting mainly for the voluntary payments on the part of the defaulting lessee. We ultimately calculate a weighted average of the resulting losses on the securities based on the likelihood of an originator default and the timing of such default.

Fixed or Stochastic Recovery Rates

Typically, either we use a stressed recovery assumption as a fixed recovery rate in our modeling, or we model stochastic recoveries, particularly when using a Monte Carlo simulation to simulate a pool-specific default distribution. We derive the recovery rate distribution using the expected recovery rate, estimates of the recovery rate variability, correlations across recovery rates, and an assumption about the general shape of the distribution. Stochastic recoveries allow us to explicitly reflect the probabilities of possible recovery scenarios. This approach produces the same model result as the "stressed" recovery rate approach for an appropriately chosen stressed recovery rate, which is typically lower than the mean of the recovery rate distribution for high target ratings.

Prepayment Rate Analysis

Prepayment and Lease Cancellation Effects

Prepayments affect transactions in two ways. First, higher voluntary prepayments tend to reduce the lifetime defaults on a pool of assets: assets that prepay, by definition, cannot default. Consequently, we incorporate the impact of possible prepayment rates in our projections of defaults.

Second, higher prepayments tend to reduce the aggregate amount of excess spread generated by the assets over the transaction's life: assets that prepay, whether voluntary or involuntary, by definition stop generating excess spread. Therefore, we incorporate the impact of possible prepayment rates in our analysis of the credit protection that excess spread can provide.[20]

Prepayments tend to be lower for leases than for loans because obligors usually cannot prepay leases unless they wish to upgrade the equipment. In some jurisdictions, lessees enjoy financial benefits because the lease payments are tax deductible, which further limit the incentive to prepay or cancel the lease. Canceling a lease for an equipment upgrade usually incurs a penalty to the lessee, which, in practice, the leasing company can waive. However, when it happens, originators in lease-backed securitizations are usually required to buy back canceled leases at prices equal to the receivables' outstanding balances. Therefore, we analyze the cancellation rates, and if relevant, we consider the likely future ability of the originator to repurchase the receivables as required.

Pool Characteristics Impact on Prepayments

To analyze prepayment rates, we examine the originator's historical data, if available, compare prepayment rates from similar transactions and assess any factors that might cause the pool being securitized to behave differently from the historical experience; for example, high-interest loans have more of an incentive to prepay than low-interest assets do.

An additional type of prepayment risk can arise from how originators value the equipment leases or loans supporting the securitization. In some transactions, the originators value the assets by discounting the cash flows from each loan or lease in the pool at a single (pool-wide) rate lower than the individual interest rate on many or all the leases or loans. This valuation method introduces prepayment risk or the risk that the higher-coupon contracts will prepay faster than the lower-coupon contracts.[21]

[20] For more information, see the "Excess Spread Benefit" section.

[21] For more information, see Appendix 6.

Structural Analysis and Liability Modeling

In this section, we explain how we analyze the structural features of an equipment-backed securitization, including how we model and allocate cash flows to different classes of securities, taking into account asset cash flows and available credit support.

Modeling the Expected Loss

We typically use a probabilistic model, often coupled with a cash flow model of the transaction, to evaluate any losses that investors would incur in some asset loss scenarios, which we assume will occur with a frequency consistent with our specific asset loss distribution. The model helps us assess the benefit from various sources of credit enhancement and the transaction's structural features. The type of modeling depends on the complexity of the transaction's actual cash flow structure.

In some established markets, cash flow structures for equipment-backed transactions are often standard, with some sponsors repeatedly using the same basic structure. In these cases, we often use a generic, relatively simple model to analyze the potential losses for the different classes of securities, sometimes supplementing it with separate modeling of one or more special features. The standard structure's main characteristics are the following: (a) interest payments on all the securities have the highest payment priority after trustee and servicing fees and are senior to all the principal payments; (b) the principal of the securities is paid sequentially among the various classes, with the most senior securities outstanding getting all principal payments until they are paid off in full; and (c) the principal payment due for the particular distribution period on the equipment-backed transaction is equal to the reduction in the discounted principal balance of the pool for that period.

In certain cases, for sequential pay structures, which we expect to deleverage very quickly, we may give credit to amortization (typically for a few months after transaction closing) by using a higher credit enhancement in our modeling and adjust other parameters accordingly.

In certain regions, repeat issuers are fewer, and structures tend to be more varied and complicated. In these cases, we use a more comprehensive tool that can accommodate in a single cash flow model many of the specific structural elements and risks that can lead to material differences in the rating analysis. This comprehensive cash flow model, ABSROM™, enables us to model transaction cash flows derived from portfolios of equipment leases and loans and the associated liability structure. The model produces a series of loss scenarios, with outputs for each security that include the expected loss, weighted average life, and default probability. The key input parameters to that type of model typically include the following:

- yield earned on the assets for each period, taking into account any stresses that could cause a decline in the yield
- scheduled amortization of the assets
- an assumption about the prepayment rate of the assets
- an assumption about the timing of asset losses or defaults throughout the life of the transaction.
- an assumption on the lag to recoveries on defaulted assets
- transaction fees
- interest rates on the securities, including the effects of any interest rate swaps
- reserve amount, including the conditions under which the amount will change

- transaction's allocation of cash flows and losses among the various transaction parties, including different classes or tranches of securities
- triggers that can change those allocations.

When modeling the timing of losses or defaults throughout the life of the transaction, we may assume a constant default rate over the life of the portfolio leading to a flat default timing curve. In other cases, we may derive a timing of default based on the historical data. We also run sensitivity analyses on the timing of default and sometimes adjust the rating on the securities, if the model output is particularly sensitive to different default timings.

Excess Spread Benefit

Excess spread is the difference between the interest earned on the leases or loans and the sum of (1) the interest paid on the securities plus (2) transaction fees, and it can provide a significant amount of credit protection to investors. However, the exact amount of protection is unknown at the start of the transaction and depends on three main factors:

- The amount by which the average interest rate on the assets could change over the life of the security because of higher-interest-rate assets prepaying faster, which we refer to as weighted average coupon deterioration or yield compression. In general, the weighted average coupon deterioration does not apply to leases, in particular when the discounting approach is used for the valuation of lease cash flows.
- The speed with which leases or loans prepay during the life of the security.
- The amount of excess spread that leaks out of the transaction before it is needed to protect investors. The risk of leakage is typically highest in the early months of a transaction when losses are relatively low.

The way we account for these risks depends on whether we use a single comprehensive cash flow model or a simpler, generic model. When using a comprehensive model, we incorporate assumptions directly into the model to account for the risks. Specifically, we assume the following:

- Assets with the highest interest rate, up to a specified portion of the pool, will prepay immediately. We determine the size of the specified portion we assume will prepay immediately based on historical data, which could differ by type of asset.
- The prepayment rate will be higher than we expect.
- Asset losses will follow the typical timing. Asset losses tend to be relatively low early in the transaction's life, which implies that excess spread will leak out unless the transaction documents provide for some means of excess spread "capture."

When we use a simpler, generic model, we first calculate, through a separate module, a "stressed" aggregate amount of excess spread by assuming the following, when applicable:

- The highest-interest assets will prepay immediately.
- The prepayment rate will be higher than we expect.
- A portion of the excess spread that is expected to be generated in the first year of the transaction leaks out.

In a second calculation, we directly link the excess spread benefit to the cumulative credit losses that the underlying collateral pool may experience and the amount of hard credit enhancement, such as subordination, over-collateralization, and reserve available to a security. In this second method of calculating excess spread, the exact benefit of excess spread will depend on factors such as (1) the speed of loan prepayments, defaults, and recoveries during the life of the transaction; and (2) the amount of excess spread that "leaks out" of the transaction before it is needed to protect investors.

For the second calculation, we assume a linear relationship between excess spread and cumulative credit losses expected on the collateral pool for a given level of prepayments such that, the higher its cumulative credit losses, the lower the excess spread it generates. We then estimate the breakeven loss for each security by setting the level of pool losses equal to the excess spread available for each security plus the available hard credit enhancement, including subordination, over-collateralization, and reserve account. The breakeven loss of a security is the level of losses incurred by the pool before the first dollar loss is attributed to the security. Once we have the breakeven security loss, we determine the "breakeven excess spread" for the security by subtracting the hard credit enhancement available for each security from the breakeven security loss level.

The final excess spread benefit is the minimum of (1) the stressed excess spread and (2) the breakeven excess spread linked to cumulative losses of the pool and hard credit enhancement for a security.

When we evaluate excess spread for lease transactions, we also consider how the lease cash flows are valued in comparison to the implicit lease rate. A discount rate lower than the implicit lease rate means the lease will create less excess spread than it would otherwise.[22]

Finally, in certain lease transactions where residual values are not securitized, the interest component on the residual amount contributes to the available excess spread. We consider this aspect when we assess the excess spread benefit.

Residual Value as Additional Credit Enhancement

In some US transactions, the lease-end residual values are used to provide additional credit enhancement.

Typically, equipment-backed securitizations employ various structures that enable residuals to act as credit enhancement. In cases where originators partially (or do not) securitize equipment residual value, the proceeds from the non-securitized residuals act like excess spread as the excess is distributed back to the equity holder if there are no defaults to offset or mechanism to accumulate in any given period. The use of residuals is, therefore, a result of the interplay between the timing of residual maturities and defaults over the transaction's life.

The haircut applied to the residual proceeds is determined on a case-by-case basis and adjusted for several factors, in addition to those mentioned in the preceding section:

» **The distribution of residual proceeds over the life of the transaction and the shape of the default-timing curve - "Use-it-or-lose-it" approach**. Similar to excess spread, if residual payments are not needed to cover defaults or to build the reserve account or over-collateralization, they revert to the issuer and cannot be used to offset subsequent lease defaults - the so-called use-it-or-lose-it effect. To determine the degree of use-it-or-lose-it, we analyze the potential timing of the defaults on the pool compared to the residual realization timing. For example, if the default curve indicates that defaults are unlikely to occur in the first six months of the transaction, but 10% of the booked residuals are scheduled in this period, those residuals likely will flow out of the transaction unless there is a structural provision that traps the residuals in a reserve account or as over-collateralization. On the other hand, if

22 For more information, see Appendix 6.

the residuals are concentrated towards the end of the transaction, the haircut for use-it-or-lose-it would be lower because the residuals will be available to cover defaults later in the transaction even if they are not trapped.

» **The order in which the residuals and the reserve fund are used to offset lease losses**. Using residuals to offset defaults before using a reserve account would reduce the use-it-or-lose-it effect.

» **The overall level of defaults and obligor concentration**. An obligor default on a contract with a residual component most likely results in liquidation proceeds that are insufficient to cover the contract's residual component. In other words, the trust cannot rely on residual proceeds as credit enhancement if the underlying contract defaults. As a result, the residual realization needs to be further stressed to account for defaults corresponding to the targeted rating level.

Short-Term ("Money Market") Tranche Risk

Some transactions include a money market tranche that matures within 13 months of issuance. A key part of our analysis is determining the likelihood that the transaction (including consideration of available liquidity accounts) will provide sufficient cash flow to pay off the tranche before its stated legal final maturity. To analyze this risk, we focus on the timing of cash flows from the underlying assets.

For a money market tranche to be rated Prime-1 (sf), we typically expect the cash flows in our base case scenario to be sufficient to completely pay down the tranche at least three months before its legal final maturity. When we evaluate the cash flows, we consider the expected level of defaults, recoveries, prepayments, residual realizations, and recovery lag until the money market tranche's legal final maturity. A higher probability of servicer disruption and accompanying payment delays or volatile payment characteristics of the underlying collateral may require a cushion greater than three months.

In addition, we assess whether the cash flows the securitization assets provide to the tranche in a "stress" scenario – in which delinquencies and losses are high, prepayments and residual value realizations are low and paid with a longer-than-expected lag – will be sufficient to pay off the tranche before its maturity date.

Specific Risks in Synthetic Transactions

When the credit risk is transferred synthetically (e.g., through credit default swaps), we focus our analysis on:

1) The specific credit event definition, such as failure to pay, bankruptcy, and some restricted restructuring or loss definitions. A definition may be considered tighter or looser depending on the number and type of contingencies that trigger a protection payment and on the level of subjectivity in their quantification.

2) The counterparty risk associated with the originator as a credit protection buyer (typically mitigated by advance payments depending on the originator's creditworthiness).

3) The loss allocation mechanism. The loss amount is generally defined as the credit protection payment (i.e., the payment made by the issuer/protection seller to the originator/protection buyer that is triggered by the occurrence of a credit event). Securities to which losses are allocated are partially written down in the amount of such loss amount.

4) The synthetic excess spread mechanism, if any. Typically, the excess spread is either available on (i) a use-it-or-lose-it basis (i.e., at a fixed amount, generally a percentage of the non-written-off security balance or the performing portfolio) for a given period (generally one quarter or one year), making it sensitive to the timing of defaults; or (ii) a trapped basis (i.e., at a fixed amount, generally a

percentage of the non-written-off securities or the performing portfolio). In each period, to the extent not used before, excess spread is accumulated in a specific ledger.

5) Potential moral hazard problems resulting from the reliance on the credit protection buyer to (a) provide notification of a credit event (as public information is usually not available) and (b) calculate the loss amounts in its capacity as calculation agent (typically mitigated by a verification process performed by an independent third-party).[23]

Expected Loss Approach and Use of Model Output

We typically use a model to calculate the security's loss in each asset loss scenario for the probability distribution. The model then weights each security's loss by the frequency implied by the probability distribution. We then sum the weighted losses to calculate the security's expected loss. We determine the model output for the security based on our benchmark relationships between a security's expected loss, the security's weighted average life, and our various rating categories.[24]

For equipment ABS transactions backed by granular or mixed pools of equipment leases and loans originated in the US or Canada, we use a generic, relatively simple model, Multi-Class. Multi-Class uses portfolio-related assumptions in the form of a portfolio expected loss and a loss equivalent to a Aaa stress to calibrate a lognormal collateral loss distribution. We use Multi-Class to derive the potential losses for the different securities, taking into consideration the relevant capital structure. We sometimes supplement our modeling with additional analysis of special features.

This analysis reflects the credit risk of the underlying assets, that is, the risk resulting from potential obligor defaults. In transactions that also have residual value risk, we evaluate whether the total amount of credit enhancement is sufficient to offset both the credit risk on the underlying assets and the risk that the realized residual values will fall short of the value assumed in the securitization. That is, the total amount of credit enhancement that we deem as consistent with a particular rating will be the sum of (a) the amount that we deem to be consistent with asset credit risk as described in the "Asset Analysis and Related Modeling" section, and (b) the amount that we deem to be consistent with residual value risk, as described below.

Residual Value Risk

Defining Residual Value Risk

In some lease transactions – particularly operating lease-backed transactions – the securities are backed in part by an assumed valuation of the equipment at the end of its lease. The valuation can be realized by either selling or re-leasing the equipment. However, if the expected residual value is not realized, credit enhancement is needed to offset this risk.

Our residual value risk analysis applies only to the portion of the pool made up of residual value and is distinct from our credit risk analysis. In our model, we apply the residual value risk analysis only to those leases that reach the residual value realization stage, i.e., only to those leases assumed not to default.

We evaluate the credit enhancement necessary to offset the residual value (RV) risk using the following formula, in which we assume a Aaa target rating. The haircut would be adjusted for a lower rating target.

23 For more information, see our approach to assessing counterparty risks in structured finance and our approach to rating corporate synthetic obligations. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

24 For more information, see the discussion of Idealized Probabilities of Default and Expected Losses in *Rating Symbols and Definitions* (a link can be found in the "Moody's Related Publications" section) and in the "Loss Benchmarks" section.

FORMULA 1

$$Residual\ value\ credit\ enhancement = Share\ of\ RV\ in\ pool \times (1 - Probability\ of\ lease\ default) \times (Aaa\ Level\ of\ RV\ haircut)$$

Source: Moody's Investors Service

In some cases, for example, in certain financial lease transactions in Europe and usually in transactions backed by financial leases for which the portion of residual value is much smaller than the actual market value of the equipment, the originator must continue making the lease payments to the securitization vehicle if the lessee decides not to purchase the equipment when the lease ends. We thus assess the value of the obligation in mitigating residual value losses by incorporating the originator's credit quality into our analysis.

Credit Enhancement for Pools with Residual Value Risk – Sample Calculation

Exhibit 2 shows a sample calculation of the credit enhancement level that we deem consistent for the residual value risk on a Aaa-rated security as well as the total Aaa-level credit enhancement, which includes both the residual value risk and credit risk.

EXHIBIT 2

Sample Calculation: Aaa-Level of Credit Enhancement for Pools with Residual Value Risk

	Variable	Value	Source
(1)	Share of residual value of pool (PV basis)	18%	Data from the offering memorandum/securities prospectus
(2)	Aaa-level residual value haircut	60%	Committee decision based on a variety of considerations affecting residual value realizations
(3)	Expected Loss	3%	Committee decision based on static pool analysis and other considerations
(4)	Aaa-level credit enhancement for credit risks	15.00%	Committee decision based on expected loss, variability of losses, and numerous other factors
(5)	Recovery rate	20.00%	Committee decision based on historical recovery rates
(6)	Aaa-level probability of default	18.75%	(4) / [1-(5)]
(7)	Aaa-level credit enhancement for residual value	8.78%	(1) * [1-(6)]*(2)
(8)	Total Aaa-level credit enhancement	23.78%	(7) + (4)

Source: Moody's Investors Service

Influential Factors on Residual Value Risk

We infer a probability of lease default from our analyses of the expected loss and recovery rate for leases in the pool. Our assumption on the portion of the residual value that is not realized (i.e., the residual value haircut) is based on the following factors:

» The target rating being considered.

» A higher haircut for higher ratings.

» The lessor's ability to remarket and sell the equipment in the secondary market or to re-lease it.

» The likelihood that the lessor will be able to continue to serve as the remarketer of the equipment and the feasibility of replacing the lessor in that capacity.

Even if a servicer is highly capable of realizing strong residual values, the realization of residual values may be interrupted if the servicer experiences financial difficulties. That risk is higher if the servicer is low rated or unrated. The risk is also higher if it is likely to be difficult to find a capable replacement servicer, which is frequently the case for many specialized equipment types.

- The originator's track record in realizing residual value.
- The consistency of the originator's historical experience.
- The credit quality of the lessees.

  The credit quality of the lessees affects the likelihood that they will be able either to purchase the equipment when the lease ends or to extend the lease.

- The types of equipment in the pool.

  Residual value realization rates tend to be specific to the type of equipment. Lessees are more likely to purchase equipment or extend leases if the fixed cost of replacing the equipment is high; for example, purchase and extension rates for telecommunications equipment tend to be high because of the high cost of replacement.

- Concentrations in equipment types.

Concentrations increase exposure to unexpected declines in residual values of a single equipment type.

Loss Benchmarks

In evaluating the model output for equipment-backed ABS transactions, we use several different methods for determining loss benchmarks.

In evaluating the model output for ABS transactions backed by granular pools of equipment leases and loans which are originated in the US or Canada, we use an Internal Rate of Return (IRR) benchmark. Modeled IRR reductions are associated with benchmark ratings in Moody's IRR Reduction Rates table,[25] which indicates the internal rate of return reduction interval associated with each given rating level.

In evaluating the model output for other equipment-backed ABS (including those with non-granular pools which are originated in the US or Canada), we select loss benchmarks referencing the Idealized Expected Loss table[26] using the Standard Asymmetric Range, in which the lower-bound of loss consistent with a given rating category is computed as an 80/20 weighted average on a logarithmic scale of the Idealized Expected Loss of the next higher rating category and the Idealized Expected Loss of the given rating category, respectively. For initial ratings and upgrade rating actions, the upper-bound of loss consistent with a given rating category is computed as an 80/20 weighted average on a logarithmic scale of the Idealized Expected Loss of the given rating category and the Idealized Expected Loss of the next lower rating category, respectively. When monitoring a rating for downgrade, the upper-bound of loss is computed as a 50/50 weighted average on a logarithmic scale. That is, the benchmark boundaries of loss appropriate for evaluating rating category *R* are given by:

25 For more information, see the discussion of Internal Rate of Return (IRR) Reduction in *Rating Symbols and Definitions*. A link can be found in the "Moody's Related Publications" section.

26 For more information, see the discussion of Idealized Probabilities of Default and Expected Losses in *Rating Symbols and Definitions*. A link can be found in the "Moody's Related Publications" section.

FORMULA 2

$$[1]\ Rating\ Lower\ Bound_R = exp\{0.8 \cdot \log(Idealized\ Expected\ Loss_{R-1}) + 0.2 \cdot log(Idealized\ Expected\ Loss_R)\}$$

$$[2]\ Initial\ Rating\ Upper\ Bound_R = exp\{0.8 \cdot \log(Idealized\ Expected\ Loss_R) + 0.2 \cdot log(Idealized\ Expected\ Loss_{R+1})\}$$

$$[3]\ Current\ Rating\ Upper\ Bound_R = exp\{0.5 \cdot \log(Idealized\ Expected\ Loss_R) + 0.5 \cdot log(Idealized\ Expected\ Loss_{R+1})\}$$

Where:

» Rating Lower Bound$_R$ means the lowest Idealized Expected Loss associated with rating R and the expected loss range of rating R is inclusive of the Rating Lower Bound$_R$;

» Initial Rating Upper Bound$_R$ means the highest Idealized Expected Loss associated with rating R that is either initially assigned or upgraded and the expected loss range of rating R is exclusive of the Rating Upper Bound$_R$;

» Current Rating Upper Bound$_R$ means the highest Idealized Expected Loss associated with rating R that is currently outstanding and the expected loss range of rating R is exclusive of the Rating Upper Bound$_R$;

» R-1 means the rating just above R;

» R+1 means the rating just below R.

» The Rating Lower Bound for Aaa is 0% and the Rating Upper Bound for C is 100%. These are not derived using the formula.

Source: Moody's Investors Service

In certain equipment-backed ABS transactions which are originated in Japan, we use a model assessing failures of scenarios with no mapping to the Idealized Expected Loss nor IRR benchmarks.

Other Considerations

Along with our asset, structural, and liability analysis, we consider other quantitative and qualitative factors in our credit analysis, such as transaction counterparty risks, legal risks, country ceilings, and environmental, social and governance (ESG) considerations.

Counterparty Risks

We consider and integrate various counterparty-related risks at different stages throughout our credit analysis. More specifically, the risks we consider include hedge counterparties, operational risks, commingling risk, account banks, and set-off risk.[27]

The performance of an equipment-backed transaction depends not only on the creditworthiness of the underlying portfolio but also on the:

» creditworthiness of hedge counterparties (if any)

» effective performance by various parties such as servicers, cash managers, and trustees

» creditworthiness of the issuer's account bank(s) and the quality of issuer's investments (if any)

We analyze the role of such counterparties, their ability to carry out that role, their operational and financial stability, and backup mechanisms incorporated in the transaction.

[27] For more information, see our methodology for assessing counterparty risks in structured finance transactions. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Hedge Counterparties

We analyze the rating impact of exposures to hedge counterparties, including assessing the probability of a transaction becoming unhedged and deriving additional potential losses. As part of our analysis, we may conclude that we adjust the ratings to reflect the linkage and additional loss.

Operational Risk

Operational risks can arise from various potential sources, including disruption to cash flows caused by the financial distress of a service provider to the equipment-backed transaction. As part of our analysis, we consider the financial disruption risk and the roles of servicers, cash managers or trustees, and similar parties.

In case the operational risks are not adequately addressed in a transaction structure, this may preclude the transaction from achieving the highest rating. Transactions with operating leases can be subject to special types of operational risks, which we describe below.

An operating lease is one (a) whose term is short compared to the useful life of the equipment and (b) in which the lessor retains ownership of the assets and assumes the residual value risk of those assets at lease maturity. The lessee has several options at that time: pursuing the lease, returning the equipment, or purchasing the equipment at their market value. Transactions backed by operating leases typically include the residual value amount. In addition, some transactions are structured to include rolled-over contracts in the securitized pool, subject to eligibility criteria. As a result, operating leases have a stronger linkage with the originator than financing leases do, in which case we examine the impact of the bankruptcy of the lessor on the expected asset cash flows.

Certain finance lease contracts can have specific characteristics that could also result in reliance on the continuity of the originator's business.[28] For example, lease termination or set-off risk may arise when an insolvent originator ceases to perform its service obligations (e.g., maintenance) in relation to leased assets. We assess the likelihood of these risks taking into account the applicable legal framework as well as the ability and incentives of an insolvent lessor to continue its servicing functions.

Account Banks and Investments

Generally, our analysis of account banks and temporary investments consists of three steps: (1) we assess the "rating uplift" to the account bank's rating to obtain an "adjusted" rating; (2) if the adjusted rating is below a certain threshold, we assess the exposure of the transaction and categorize the risk into either "standard" exposure or "strong" exposure; and (3) we determine rating caps to the transaction ratings subject to other quantitative and qualitative factors.

Commingling Risk

In equipment lease and loan transactions, funds owed to investors may be "commingled," with funds of another transaction party, before the funds' transfer to the issuer's account. If that other party becomes bankrupt, it may be difficult to determine the source and ownership of the commingled funds, resulting in an additional loss for investors. Our analysis captures whether commingling risk exists in a transaction, determines the credit quality of the party and the exposure, and incorporates the additional loss.

Set-off Risk

In equipment lease and loan transactions, set-off could, for example, arise when a borrower sets off a deposit balance against an outstanding loan amount following a default of the (originating) bank. The amount of the set-off would result in a reduction in the principal amount of the loan pool and, effectively, a

[28] For more information, see Appendix 5.

loan loss. The risk is typically small in instances of retail deposits covered by a deposit insurance mechanism. However, the risk can be larger in jurisdictions that do not have deposit insurance systems and for corporate and public sector obligors.

To analyze this risk, we assess the laws and regulations in the specific jurisdiction that govern the right to set off deposits in the event of bankruptcy. In jurisdictions that allow set-off and for transactions without structural protections to fully mitigate set-off risk, we estimate the potential set-off exposure by modeling the likelihood of a default by the originator and how much the originator owes to loan obligors.[29]

Equipment lease and loan transactions could also be exposed to set-off risk arising from contractual claims other than deposits. In such cases, we will also evaluate mitigating factors and, if considered insufficient, determine any expected incremental loss from set-off.

Legal Risks

We assess legal risks which may affect the expected losses posed to investors. In particular, we consider the potential legal consequences of whether the issuer is bankruptcy remote. We review legal opinions at closing to inform our views on the key legal risks identified in a transaction.

We analyze the extent to which the transaction is protected against the effects of a bankruptcy of the transaction sponsor or the issuer of the securities. Potential effects include delays in payments to investors and investors becoming unsecured creditors in the estate of the bankrupt entity and, in some cases, losing some of the cash flows because of amounts set off against funds owed by the bankrupt entity to its creditors. For transactions with leases in the asset pool, we also evaluate the extent to which lessee bankruptcies could endanger cash flows to investors through rejection by the bankrupt lessees of the lease contracts.

Bankruptcy of the Originator

We analyze whether the originator is bankruptcy remote such that the likelihood of (1) a bankruptcy filing by or against it; or (2) substantive consolidation – that is, the pooling of the issuer's assets and liabilities with those of a bankrupt affiliate – is so low that it has no rating impact. If we determine that the originator is not bankruptcy remote, we assess the potential rating impact on a case-by-case basis according to the likelihood of bankruptcy and the possible negative consequences for investors.

Our analysis of the potential bankruptcy of the originator takes into consideration the following factors:

» whether the originator has sold the receivables, known as "true sale"

» whether, in the event of the sponsor's bankruptcy, a court would consolidate the owner of the assets, the securitization trust, with the sponsor (substantive consolidation)

» whether the securitization trustee can enforce its ownership or security interest in the collateral once the originator has filed for bankruptcy protection ("perfection").

Our analysis also takes into account jurisdiction and applicable securitization laws.

Local and Foreign Currency Ceiling Considerations

The country in which the transaction's assets, originator, or issuer is located could introduce systemic economic, legal or political risks to the transaction that could affect its ability to pay investors as promised.

[29] For more information, see our cross-sector approach to assessing counterparty risks in structured finance including analyzing set-off related risks. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

We usually incorporate such risks into the analysis by applying our local currency ceilings (LCC).[30] In particular, when generating our assumed portfolio loss distribution, we typically define the portfolio credit enhancement consistent with the highest rating achievable in a country (i.e., the LCC). We may also consider modifying appropriate assumptions or defining minimum credit enhancement levels required to achieve a particular rating.[31]

Environmental, Social and Governance Considerations

Environmental, social and governance (ESG) considerations may affect the ratings of securities backed by equipment leases and loans. We evaluate the risk following our cross-sector methodology that describes our general principles for assessing these ESG issues[32] and may incorporate it in our analysis.

Monitoring

In this section, we describe our approach when monitoring transactions. We generally apply the same key components as we apply when assigning ratings, except for those elements of the methodology that could be less relevant over time.

We generally apply the key components of the approach described in this methodology when monitoring transactions, except for those elements of the methodology that could be less relevant over time, such as originator assessment, underwriting standards for static pools, or review of the legal structure.

Transaction Performance

We typically receive periodic data on the transaction-specific performance, which we use to monitor transactions. We may give more weight to performance information for seasoned transactions, in particular when defaults and losses are higher or lower than expected.

When monitoring the performance of outstanding equipment ABS, we track the characteristics, if available, and performance of the underlying collateral, developments regarding the originator, servicer, and other participants in the transaction, the amount and form of credit enhancement, and the factors that affect the integrity of the legal structure. The starting point is typically the monitoring of the collateral performance relative to our initial expectations.[33]

30 For more information, see our cross-sector methodology for assessing local currency country risk ceilings. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

31 For more information, see Appendix 8.

32 A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

33 For more information on revising performance metrics over the life of an EMEA equipment lease- or loan-backed transaction, see Appendix 10.

The key performance metrics we track are the transaction's delinquency rate and the cumulative net loss rate, or the cumulative default and recovery rates. We combine the loss rate with the issuer's history of losses to update our estimate of the ultimate lifetime net loss rate on the pool of loans. Updated individual loan data, if available, also allow us to derive updated estimates of individual asset defaults or losses. Such loan-level data is particularly important when the pool has concentrations.[34] In addition, we take into account any material changes in the macroeconomic environment that could affect future performance. When appropriate, we run a model (or a simplified model) to evaluate the security's expected losses, similar to the approach we use to assign the initial ratings.[35]

With regard to counterparty risk, our monitoring analysis also includes an assessment of the operational and financial stability of the originator, servicer, swap counterparties, and credit support providers. If these entities become unable to fulfill their obligations to the transaction, the risk of a decline in the cash flows to investors grows. Thus, changes to the operational and financial stability of such an entity can result in a rating action on the securities.

When the sovereign risk component changes over the life of an equipment-backed transaction, we will assess the impact on the expected loss of the securities following the approach described in Appendix 7. We will adjust the maximum achievable rating based on the then-current LCC and may adjust the key collateral assumptions to reflect the change in the sovereign risk.[36] In some instances, the maximum achievable rating for the most senior outstanding securities may be lower than the LCC if other risks such as counterparty-related risks cap the ratings. Ultimately, rating committees conclude whether the change in sovereign risk impacts the rated securities.

Pool Size

Some equipment loan/lease pools can be concentrated at closing. In addition, as pool sizes decrease to a small fraction of their initial sizes during the life of the transaction, credit risk exposure to individual obligors may increase significantly.

In assessing pool diversity for equipment-backed securitizations, we look beyond the nominal number of obligors in a pool to consider the actual size of their exposures. We express this pool diversity measurement, referred to as the effective number, in terms of equal-sized exposures using Formula 3. When individual obligor information is not received regularly (e.g., quarterly or semi-annually) to assess the pool's effective number, we will use the number of leases or loans to determine diversity.

FORMULA 3

$$Effective\ Number\ of\ Obligors\ = 1/\sum_i^n (W_i)^2$$

Where:

» W_i is the weight of an obligor i in the total pool.

Source: Moody's Investors Service

We usually calculate the pool's effective number based on information from the pool's loan level (or lease level) data. We typically use an effective number of 250-300 as a limit between what we consider a

34 For more information on European multi-pool lease transactions, see Appendix 9.

35 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.

36 For more information, see our approach to assessing counterparty risks in structured finance. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publication" section.

concentrated pool (EN below 250-300) that would benefit from an individual asset approach versus a granular pool (EN above 250-300) that can rely on a pool approach – For more information, see Appendix 1 ("Concentration Risk").

Concentrated Pools

To assess whether the pool diversity is in line with the rating of the securities, it is important that we have information about the distribution of obligors by industry sectors as well as the characteristics of leases or loans. This information is essential for concentrated pools on which we use the "individual asset approach" at transaction closing and during transaction life.

As a result, unless we have detailed information that allows us to infer a probability of default on a significant percentage of the obligors by exposure balance (for example, ratings, credit estimates, credit scoring systems, SCAs, RiskCalc-based default probabilities), we will not assign nor maintain ratings on equipment-backed securitizations with concentrated pools.

In particular, we will not assign ratings if the percentage of unrated obligors with no individual assessment, as described in the Alternative Approaches to Individual Asset Default Probabilities section, exceeds 15% of the principal balance of the collateral pool at closing (subject to certain conditions as outlined above; 10% otherwise). We will not maintain ratings if the percentage of unrated obligors with no individual assessment then comes to exceed 25% of the outstanding pool balance during the life of the transaction, and this exceedance is not cured within 90 days.

Granular Pools

Granular pools at closing are typically not exposed to concentration risk until late in the transaction life. As part of our analysis of equipment-backed securitizations, we assess the evolution of pool diversity and determine whether the amount of credit enhancement under a given class of securities protects this class from the risk of a default by the largest obligors. In addition, we will not maintain ratings on securities backed by equipment leases or loans (contracts) with the following characteristics:

» For securitizations without support mechanisms, such as credit enhancement floors or reserve fund floors: when the underlying pool has reached an effective number of obligors or exposures 50 or below. If we cannot obtain the effective number, we will use a threshold of 90 obligors or contracts instead.

» For securitizations with reserve fund or credit enhancement floors, which partially compensate for the increased exposure to single obligors: when the underlying pool has reached an effective number of obligors or exposures of 30 or below. If we cannot obtain the effective number, we will use a threshold of 45 obligors or contracts instead.

Other Pool Size Considerations

However, we make exceptions regarding the pool size constraints for securities with ratings that do not rely on our assessment of individual obligor creditworthiness, such as those that benefit from a full and unconditional third-party guarantee, whether at pool or security level or for securities that benefit from full cash collateralization. For structured finance securities with full support from a financial guarantor, if the financial guarantor's rating is below investment grade, we would expect to withdraw the rating of the security after withdrawing its underlying rating.

Appendix 1: Concentration Risk

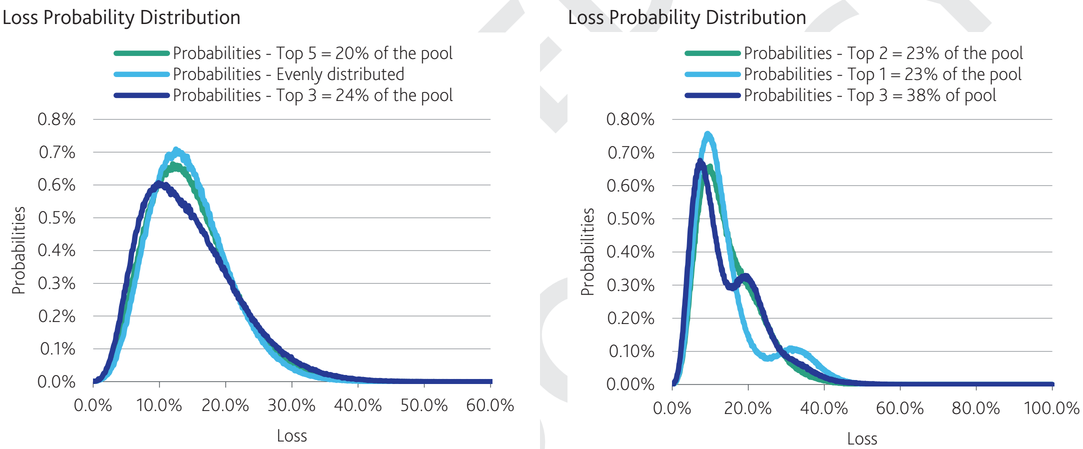
Equipment-backed pools range from very granular small-ticket pools to more concentrated heavy equipment pools. Asset concentrations, including disproportionately large individual assets, and regional and industry concentrations directly influence the shape of the asset pool default curve. As a result, the analytical approach we choose to rate a particular transaction depends heavily on how well it addresses the concentration level in the pool.

As an example, Exhibit 3 below shows the impact of various top obligor concentrations on the shape of the pool default distribution.

EXHIBIT 3

Impact of Obligor Concentration on Portfolio Default Distribution

Monte Carlo simulation results for a pool of 100 B-rated obligors in a single country (the pool is well diversified across industries; the obligors are evenly distributed in terms of size, except for the top 1, 2, 3, or 5 obligors, respectively):



Source: Moody's Investors Service

Obligor Concentration and the Effective Number Calculation

A securitized pool with significant borrower concentrations is subject to idiosyncratic loss-performance behavior that is generally difficult to predict based on the experience of historical pools. In this case, we often use a Monte Carlo simulation technique to simulate the default behavior of the individual assets based on asset-specific characteristics and assumed correlations among the assets.

Increasing the number of obligors in a pool decreases the obligor concentration, while an uneven distribution of obligor sizes tends to increase it. Our calculation of the pool's "effective number" of obligors provides us with a tool to evaluate the trade-off between the two in their effect on obligor concentration. In evaluating obligor concentration, we also consider other measures, such as the weight of the top few obligors in the pool.

The effective number adjusts the actual number of obligors in the pool by reducing it for any unevenly sized exposures to obligors. For pools with equally sized obligors, the effective number is equal to the actual number of obligors. However, the more uneven the distribution of exposures, the smaller the effective number of obligors and the larger the difference between the Effective and the actual number of obligors.

Effective Number Cutoff for Concentrated vs. Non-Concentrated Pools

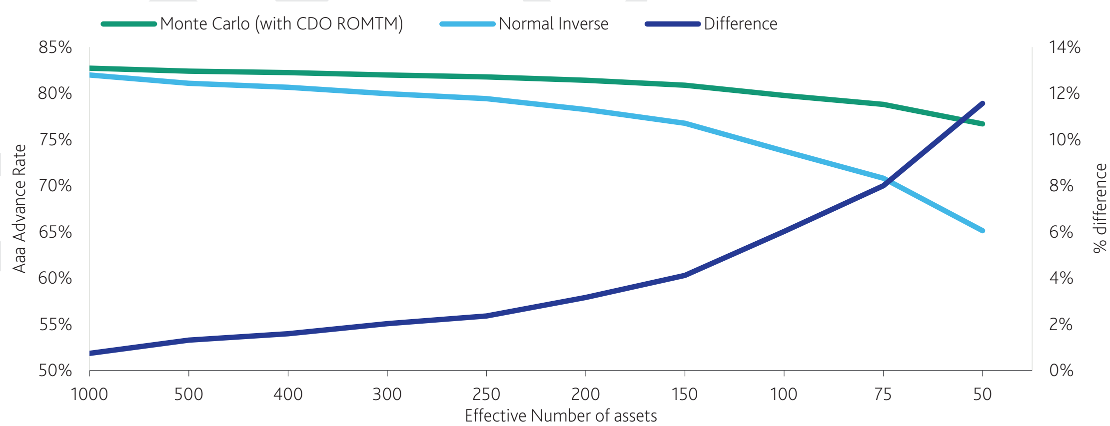
We typically consider a pool with an effective number below 250-300 as a concentrated pool that would benefit from an individual asset approach if the information is available. Conversely, we view a pool with an effective number higher than 250-300 as granular; such a pool would benefit from a pool approach, assuming pool data are available, or an individual asset approach. If the effective number of a pool is close to this 250-300 range, the rating committee determines the best approach to estimate the future defaults.

Exhibit 4 below shows the impact of lowering the effective number of obligors on the Aaa advance rate using (1) a Monte Carlo Simulation (the Individual Asset Approach) and (2) an approximation of the Monte Carlo simulation via a Normal Inverse distribution. In both approaches, the Aaa advance rate starts decreasing (i.e., the Aaa levels of enhancement starts increasing)) exponentially when the effective number falls below the 250-300 range. At the same time, the Aaa levels of enhancement for each approach start to diverge more significantly when the effective number falls below the 250-300 range, even if the expected loss and variance in the two approaches are equal. The reason for the divergence is that the normal inverse then loses accuracy as it does not adequately account for the idiosyncratic risks associated with concentrated pools. Note, however, that the distribution from Monte Carlo simulation (using MOODY'S CDOROM™ (CDOROM)) produces a lower senior security credit enhancement than the normal inverse (assuming the mean and the standard deviations of the two distributions are identical), so the approximation of the Monte Carlo simulated distribution (via CDOROM) by a normal inverse is a conservative one.

EXHIBIT 4

Impact of Lowering the Effective Number on the Aaa Advance Rate: Monte Carlo Simulation vs. Statistical Approach (using a normal inverse (NI))*

Aaa Advance Rate



* The chart shows the impact of the Effective Number on the tranching based on a purely homogenous portfolio (2% mean DP, 10% asset correlation, 0% RR). The moments of the normal inverse distribution are matched to those of the Monte Carlo simulated distribution (i.e., the mean and the standard deviations of the two distributions are identical).

Source: Moody's Investors Service

Normal Inverse Distribution Characteristics and Monte Carlo Simulated Default Distribution

Modeling defaults of a granular portfolio via a normal inverse distribution (also known as the large homogeneous portfolio approximation or LHP) is the extension of the factor model concept to an infinite portfolio of identical assets because the normal inverse distribution is the limit of the default probability distribution for a portfolio with an infinite number of assets, which are homogeneous in size and default probability and whose default behavior is driven by a single-factor model with the same pairwise correlation. Hence, the consistency of the analysis across the full spectrum of portfolios is ensured (i.e., less granular portfolios are modeled based on the Gaussian copula concept with the use of Monte Carlo simulations (CDOROM), while granular pools can be modeled based on the Gaussian copula concept via a normal inverse distribution).

The normal inverse distribution is determined using two parameters: the mean and standard deviation. On a cumulative basis, the normal inverse distribution is given by the following formula (Φ being the cumulative standard normal distribution describing the probability that the random variable D (representing actual defaults) is not greater than a cumulative default rate of q):

FORMULA 4

$$P(D \leq q) = \Phi[\frac{\sqrt{(1-\rho)} * \Phi^{-1}(q) - \Phi^{-1}(p)}{\sqrt{\rho}}]$$

Where:

» p is the mean, and ρ is the asset correlation.

Source: Moody's Investors Service

An explicit relationship exists between ρ and the standard deviation of the distribution, which is given by the following formula:

FORMULA 5

$$\sigma(D) = \sqrt{N_2(\Phi^{-1}(p), \Phi^{-1}(p), \rho) - p^2}$$

Where:

» $\sigma(D)$ is the standard deviation of the distribution and N_2 is the standard bivariate normal cumulative distribution function.

Source: Moody's Investors Service

Formula 5 links the standard deviation level with the asset correlation level in a normal inverse distribution. When we benchmark portfolios, we might convert the level of standard deviation into asset correlation using Formula 5. In this case, we refer to the resulting level of correlation as "implied asset correlation" as it represents the single level of asset correlation implied by a given level of standard deviation.

Industry Concentration

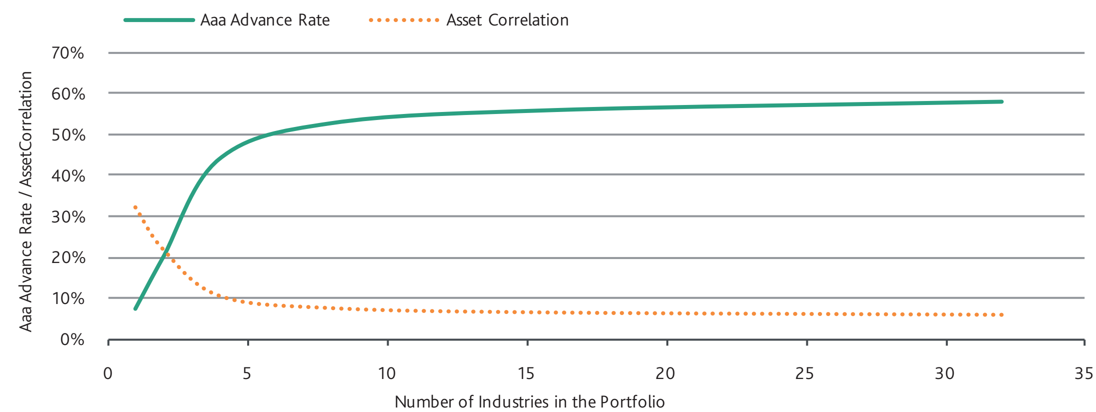
Obligors involved in similar businesses are to some extent subject to the same positive and negative factors and could all suffer concurrently from a single negative factor which would result in substantial losses in the asset pool. Industry concentration tends to vary widely in equipment-backed securitizations, although material concentrations in specific sectors (such as building and real estate) are common.

In our view, portfolios with a single-industry concentration of around 25%-30% or higher benefit from an individual asset approach because it can more accurately reflect the risk posed by deterioration in particular industries. When we use a Monte Carlo simulation and vary the industry concentration in a specific portfolio, we find that the volatility of the asset default distribution (which we can measure by the asset correlation or the coefficient of variation of the default distribution) tends to increase exponentially when the concentration in a specific industry reaches levels close to 25%-30% (i.e., asset correlations higher than 10% or a coefficient of variation higher than 50%, levels that are rare in historical data).

In Exhibit 5 below, we generated a portfolio of 480 identical assets, all rated B1 with a WAL of five years. We then split the portfolio evenly among 32, 16, 8, 4, 2, and 1 industries (i.e., in the case of 32 industries, we had 15 assets in each industry, in the case of 16 industries, 30 assets in each industry, etc.). We then extracted the default distribution in each case and tested the Aaa advance rate. Asset correlations and covariance levels tend to increase exponentially once we are left with four industries or fewer, and the Aaa advance rate then reduces significantly.

EXHIBIT 5

Aaa Advance Rate as a Function of Industries in the Portfolio



Source: Moody's Investors Service

Exhibit 6 shows the implied asset correlation (based on the mean and standard deviation of a default distribution derived for a specific portfolio composition) as a function of pool granularity and the largest single-industry concentration. In each Monte Carlo simulation scenario, we vary the effective number as well as the largest single-industry concentration. We keep the mean probability of default for the assumed portfolio at 15.1% and the second-largest industry sector constant at approximately 10%; we also assume a global inter-industry correlation is 5%. Hence, the variation in the implied asset correlations is driven mainly by the variation of the overall portfolio concentration or the single-industry concentration. Exhibit 6 shows the negative impact of sector concentrations on the implied asset correlation.

EXHIBIT 6

Implied Asset Correlation* as a Function of Granularity and Single Industry Concentration for a Sample Portfolio**

		Top single industry concentration in % of the total pool		
		21%	32%	45%
Overall portfolio concentration measured by Effective Number (EN)	Pool with 900 EN, smallest obligor accounts for 0.02% of the pool	6.50%	8.20%	11.70%
	Pool with 617 EN, smallest obligor accounts for 0.1% of the pool	6.80%	8.50%	12.00%
	Pool with 353 EN, smallest obligor accounts for 0.25% of the pool	7.10%	8.80%	12.50%
	Pool with 170 EN, smallest obligor accounts for 0.6% of the pool	7.7%	9.5%	15.1%

* Implied asset correlation is the correlation implied by a normal-inverse default distribution as defined by its mean and the standard deviation. For more details, see Box 1. Equation (2) describes this relationship and can be solved for "ρ," which represents the implied asset correlation.

** To create the scenarios in Exhibit 6, only the number of obligors was varied to reduce the EN (base case = 900 EN), while only the industry sectors were varied to increase single industry sector concentration (base case = 21% top industry sector). Consequently, the overall mean PD rate is the same in all scenarios.

Source: Moody's Investors Service

In some situations, we use historical pool performance data with the pool approach to analyze a transaction with significant industry concentrations. These situations are limited to when (a) the historical performance data relate to pools whose industry concentrations are very comparable to those of the securitized pool, and (b) such historical performance data cover at least one full economic cycle. For example, this is the case for certain agricultural equipment lease transactions in the US, for which we have received long-term historical data showing very little volatility in the agricultural equipment industry validating our low-loss volatility assumptions.

Outside such scenarios, we use the individual asset approach via a Monte Carlo simulation, which allows us to assess the impact of the pool's actual industry concentrations on the pool default distribution. In the Monte Carlo simulation, we typically add an intra-industry asset correlation on top of the inter-industry correlation if the obligors are active in the same sector. We can also further stress the pairwise correlation depending on (a) the overall portion of obligors active in a given industry sector and (b) the expected cyclicality of the sector.

Appendix 2: Equipment Securitizations Backed by Mixed Pools

When we analyze a securitization backed by mixed pools where we cannot use the individual asset approach due to a lack of information to either compute the effective number for the total pool and/or to use the top-down approach, we generally split the portfolio into sub-pools, and analyze each sub-pool as described in this methodology to derive the default or loss distributions. We then merge the distributions associated with the sub-pools. In instances where one of the sub-pools is very small (typically less than 10% of the outstanding portfolio balance), we adopt a simpler approach, applying the approach of the main pool type.

Portfolio Split

For equipment-backed securitizations, we commonly split a portfolio by obligor size to create the two sub-pools, a granular sub-pool and a concentrated sub-pool. In doing so, we also consider the type and format of the information we receive at closing and during the life of a transaction. Typically, obligors that represent more than approximately 1% of the total principal balance of the collateral pool are assigned to the concentrated pool, and the remaining portion of the pool is assigned to the granular sub-pool.

Joint Loss Distribution

1. We derive a default or loss distribution of the concentrated sub-pool, either using a Monte Carlo simulation approach. If the portion of unrated obligors with no individual assessment in the concentrated sub-pool is deemed significant, we test the sensitivity of the distribution to the default probability assumption for the unrated obligors.
2. We derive a default or loss distribution of the granular sub-pool by using a lognormal distribution.
3. We merge the two distributions assuming they are fully correlated. We construct the merged distribution quantile by quantile. For any given probability, the new distribution quantile is the weighted average of the quantiles of the two sub-pools.
4. Finally, we use the merged loss distribution as an input into our liability analysis.

Residual Value Risk Consideration

If an equipment securitization backed by mixed pools is exposed to residual value risk, we add the residual value risk to the merged distribution. We break the distribution into different intervals corresponding to our rating categories and attribute the residual value risk to each corresponding interval as an adjustment. The adjustment varies by rating category so that we allocate the highest residual value haircut to the highest rating category (Aaa) and the lowest residual value haircut to the lowest rating category (Caa/C).

Pool Size

For equipment securitizations backed by mixed pools,

- we will not assign credit ratings if the percentage of unrated obligors with no individual assessment in the concentrated sub-pool exceeds 15% or 10%, as appropriate, of the collateral pool's principal balance at closing, and
- we will not maintain credit ratings if,
  - the percentage of unrated obligors with no individual assessment in the concentrated sub-pool comes to exceed 25% of the outstanding pool balance during the life of the transaction, and this exceedance is not cured within 90 days; or
  - for securitizations without support mechanisms, the effective number of obligors has reduced to 50 or lower or, if we cannot obtain the effective number, the number of obligors or contracts has reduced to 90 or less;

– for securitizations with reserve fund or credit enhancement floors, the effective number of obligors has reduced to 30 or lower or, if we cannot obtain the effective number, the number of obligors or contracts has reduced to 45 or less.

Appendix 3: Historical Static Pool Data Analysis: Extrapolation Methods

For historical pools that reflect only a part of their life cycle but contain some useful data, we extrapolate defaults or losses to date for the remainder of the pool's life. To extrapolate default or loss data for the missing periods, we typically rely on average changes in the cumulative rate, either as an absolute number or a percentage, in similar pools during those periods.

We use one of two methods to extrapolate data series, both of which yield similar results in most circumstances. We typically use a single extrapolation method in a given market to enhance consistency across transactions.

Growth Rate Extrapolation Method

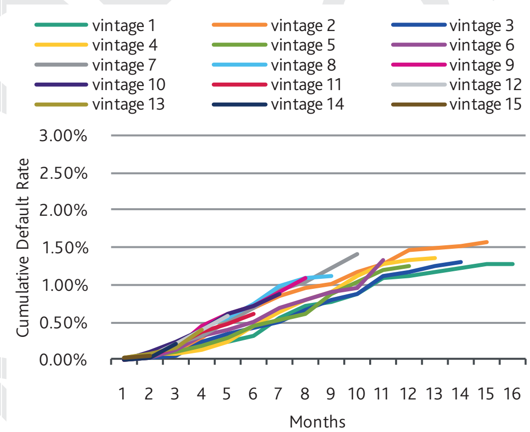
The growth rate extrapolation method is based on the growth rate calculation of the average cumulative defaults or losses if we extrapolate losses (using a comparable number of data points) during previous periods. We extrapolate default data for a vintage by multiplying the last historical data point by one plus the growth rate of the average cumulative defaults of the specific period and then repeat the process for each successive period by using the last extrapolated figure as the starting point. In Exhibit 7 below, the chart on the right shows the result of extrapolating uncompleted vintages from the chart on the left using the growth rate extrapolation method.

If the static pool performance history does not include pools that have paid down in full, we can extend the actual default curves to capture the impact of potential defaults after the observation period until the term of the loans and build a full default timing curve. To "simulate" these potential defaults, one approach is to extrapolate the default rate of the longest observed period to the weighted average maturity of the pool for each vintage curve at a rate equal to the last observed growth rate.

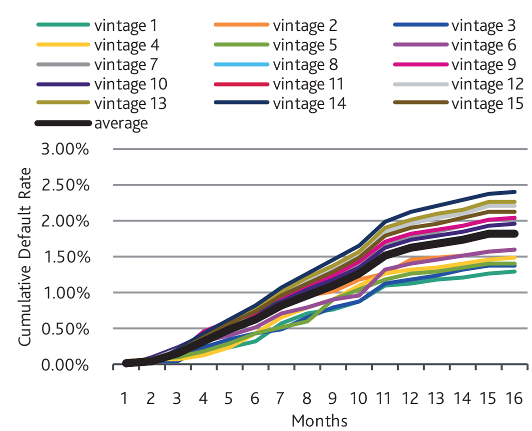
EXHIBIT 7

Example of Extrapolated Vintages

Unextrapolated Cumulative Default Rate



Extrapolated Cumulative Default Rates



Source: Moody's Investors Service

Delta Net Loss Timing Curve Method

The starting point is to create a loss timing curve for the originator. The loss timing curve provides the percentage of the overall lifetime losses the receivables are likely to incur at various intervals of the pool's life. We can use the loss timing curve to extrapolate the cumulative losses on a static pool of receivables from its current level to the expected level at maturity.

We frequently use the "delta" loss curve method to construct the loss curve. In this method, we use an increment (delta) of each vintage's cumulative loss rates to calculate the average incremental loss rates across vintages for each period (the average delta loss rate). Next, we calculate the cumulative average delta loss rate for each period by adding the incremental delta loss rates up through that period (cumulative delta loss).

If the static pool performance history does not include pools that have paid down in full, the static pools will incur losses over their remaining lives. Therefore, to apply the cumulative average delta loss to pools that we need to extrapolate, we determine the "anchor" or terminal value of the cumulative delta loss curve. We can use several methods to forecast the anchor value; in one, we analyze the trend line of six-month deltas to determine the projected six-month deltas over the remaining life. We add these projections to the life-to-date losses to determine the anchor or terminal loss.

We create the loss curve by calculating the percentage of the total cumulative delta loss incurred in each period after origination. We can then use the loss timing curve to project the cumulative loss for each vintage with an incomplete history by dividing the life-to-date loss for any vintage by the corresponding value of the loss timing curve.

EXHIBIT 8

"Delta" Loss Curve Method

Column	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
Originations (in $000')	25,216	26,878	27,815	27,327	2,694	28,433				
Pool Factor	0.01%	0.31%	1.92%	10.56%	25.38%	48.76%				

Year	1	2	3	4	5	6	Loss Curve
1	0.68%	0.86%	0.94%	0.76%	0.74%	0.72%	24.28%
2	1.73%	1.84%	2.32%	1.96%	1.74%	1.71%	58.38%
3	2.26%	2.57%	2.64%	2.39%	2.18%		73.57%
4	2.49%	3.28%	2.91%	2.75%			85.74%
5	2.59%	3.50%	3.46%				94.73%
6	2.66%	3.75%					99.69%
7	2.67%						100.00%
Projected Lifetime Loss	2.67%	3.76%	3.65%	3.21%	2.96%	2.93%	

(5) Projected lifetime loss calculation: 2.18/73.57=2.96%

(1) Delta calculation: 2.26-1.73=0.53

(3) Cumulative calculation: 0.78+1.1=1.88

(2) Average delta loss calculation: Year 1 average=0.78

Incremental static pool losses							Average Delta Loss	Cumulative Delta Loss	Loss Curve
1	0.68%	0.86%	0.94%	0.76%	0.74%	0.72%	0.78%	0.78%	24.28%
2	1.05%	0.98%	1.38%	1.20%	1.00%	0.99%	1.10%	1.88%	58.38%
3	0.53%	0.73%	0.32%	0.43%	0.44%		0.49%	2.37%	73.57%
4	0.23%	0.71%	0.27%	0.36%			0.39%	2.77%	85.74%
5	0.10%	0.22%	0.55%				0.29%	3.06%	94.73%
6	0.07%	0.25%					0.16%	3.22%	99.69%
7	0.01%						0.01%	3.23%	100.00%

(4) Loss curve calculation: 3.06/3.23=94.73%

Source: Moody's Investors Service

Appendix 4: Factors that May Affect Pool Default Variability

Expected Level of Defaults

Generally, the higher the level of expected default rate or expected loss rate on the pool, the higher the absolute measure of variability (i.e., variance) and the lower the relative measure of variability (i.e., coefficient of variation, or the implied multiple of the expected loss in the Aaa-level credit enhancement). This is because losses can increase much more from low levels than from high levels.

Historical Performance Data: Quantity, Quality, and Relevance

The specific relationship between expected loss and variability depends on the quantity, quality, and relevance of the data.[37] When the data are limited in any of these respects, we can make adjustments to account for the higher inherent volatility of losses.

Typically, the longer the period of historical performance data, the more applicable the historical volatility to our assessment. Consequently, our assessment of variability tends to be higher for countries with newer equipment lease and loan securitization markets because of the reduced amount of historical information typically available. However, even extensive performance data is helpful only if it is of sufficient quality and relevance.

Data quality depends on the type provided. Static pool data generally contain more applicable information than data from a dynamic portfolio and stratifying the static pool data can facilitate an even closer match to the securitized pool. Additional data on variables such as gross defaults, recoveries, delinquencies, and pool factors allow for more robust analysis, reducing uncertainty.

Data relevance depends on whether the factors that drove the historical performance are also likely to drive future asset pool performance. For example, we typically assess more variability when the historical performance reflects the impact of an economic environment that does not represent what the securitized asset pool is likely to experience. Similarly, we typically assess more variability when the underwriting, servicing, and collection policies and practices that led to the historical performance differ materially from those that would apply to the securitized asset pool.

Originator Experience and Track Record and Servicing Stability

Transactions from originators who have historically performed consistently within our expectations are subject to less variability than those of newer or less experienced originators or those whose previous transactions experienced unexpectedly volatile performance.

A servicer's ability to collect on the loans, mitigate losses and maximize recoveries has a direct impact on a pool's losses. Therefore, in assessing a pool's loss variability, we examine servicer stability, both financially and operationally, to determine the likelihood that the servicer will maintain consistent servicing practices and policies. We also assess the potential impact of servicer instability, for example, the degree to which disruption may affect pool losses, including disruption arising from a servicing transfer owing to servicer financial stress or a natural disaster.

Asset Concentrations

Unusual random events are more likely to affect significant portions of concentrated pools for a particular factor than diversified pools. For example, if the asset pool consists of disproportionately large obligors, a

[37] For more information, see our cross-sector methodology on global structured finance data quality evaluations. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

risk factor specific to those obligors could have a large impact on the pool. Or, if the asset pool is geographically concentrated in a particular region, it could be more vulnerable to regional economic shocks. Therefore, the performance of concentrated pools is likely to be more volatile. Consequently, our analysis includes (via specific adjustments or directly in the Monte Carlo simulation) an assessment of the size of obligors in a pool, as well as concentrations of obligor locations and other important factors such as the following:

- The type of equipment, which could make a pool vulnerable to changes in technology for a particular equipment type.
- Industries in which the equipment is used, which could make a pool vulnerable to changes in the financial conditions in a particular industry sector.
- Equipment vendors, which could make recovery values on remarketed equipment vulnerable to a particular vendor's bankruptcy.
- Obligors tied to particular franchisors, whereby the ongoing viability of pool obligors depends on the existence of a particular franchise concept. Franchisees often depend on support from a single franchisor for important services, such as advertising and product development.
- Obligors tied to particular employers or employment types.

Appendix 5: Equipment Leases or Loans with Special Risk Characteristics

Balloon Loans

Some equipment loan contracts mature before they amortize fully, resulting in a final balloon payment that is larger than the regular payment, sometimes as high as 20%-30% of the original contract balance. Such loans are generally subject to higher default risk than fully amortizing loans because an obligor with a balloon loan might need to refinance a relatively large remaining loan balance but is unable when the loan matures. The risk for securitization can be particularly acute if balloon payments are concentrated near the end of the transaction. Consequently, we assess how much credit enhancement the transaction will have to offset that risk near the end of its life. For example, structural protections against "back-end" losses sometimes include limits on how much reserves and over-collateralization can decline as the securities amortize.

Leases or Loans with Uneven and Seasonal Payments

Some leases and loans in certain equipment industries provide obligors additional flexibility by allowing uneven payment schedules or even payment "skipping" during certain periods. For example, some contracts in the medical and dental equipment sectors specify lower payments at the beginning of the contract for new medical professionals just starting their practices, followed by gradually increasing payments later during the contract term. In the agricultural equipment sector, payment terms coincide with the harvest or expected cash flows – quarterly, semiannually, or annually – and obligors often remit interest and principal payments once a year. Such uneven payments result in less cash flow available for the securitization in certain periods, possibly leading to insufficient funds to make the interest payments on the securities. Consequently, we assess whether the transaction's reserves or other mitigants, if any, can offset this liquidity risk.

Security Deposits

In some leases, the lessee must provide a security deposit, which the seller/servicer holds and uses to make the last payment under the contract. Securitization, including security deposits, can expose the transaction to additional risks, particularly for low-rated seller-servicers. For example, a lessor who becomes financially distressed might use security deposits to fund some of its working capital needs, or deposits might get tied up in a bankruptcy estate, reducing the funds available to make payments to investors. Therefore, in transactions in which sellers or servicers with weaker credit quality must use security deposits for final loan payments, we assess whether the transaction's structure can protect against that risk. For example, the structure might provide for additional reserves to cover security deposits in the transaction.

Gross vs. Net Leases

In a gross lease, the lessor (i.e., the originator) is responsible for operating, maintaining, and repairing the equipment, as well as paying insurance premia and any sales, use, property, and other taxes relating to the equipment. In a net lease, the lessee takes on some of those responsibilities, depending on the terms of the lease. Consequently, the performance of a pool with a large concentration of gross leases depends more heavily on the originator's ability and ongoing operations than a pool with net leases. That is, gross leases pose more operational risk related to the originator or servicer than net leases. Equipment lease transactions are usually backed by a portfolio of net leases.

No "Hell or High Water" Leases

We examine whether leases contain warranties provided by the lessor that could make the lessee's obligation to pay conditional on the performance of the lessor. We may also rely on the originator's representations in this respect. Leases with such warranties create more reliance on the originator's abilities and continued operations and, therefore, increase operational risk. However, leases that provide no such conditions, on which the lessee has an absolute and unconditional obligation to make full payments, are less subject to operational risk. Such leases are known as "hell or high water" leases, a category under which securitized leases in the US typically fall.

Lease Contracts with Service Obligations

Lease contracts may include various lessor service obligations, such as maintenance and support components. As compensation for the provision of these services, the lessee makes periodic service fee payments, which are typically not securitized.

In the event that a lessor becomes insolvent and ceases to service the leased assets, the leases may be vulnerable to termination at the option of the lessees. How we analyze this risk is summarized in Exhibit 9 and further explained below.

If for a particular transaction, we determine that there is a material risk of lease termination related to the cessation of servicing, we would adopt the appropriate loss assumptions in our cash flow analysis, taking into account any relevant mitigants, such as any security interest of the issuer over the leased assets or compensation claim against the originator.

For relevant transactions, we review the questions in Exhibit 9 with reference to the available information and legal advice.

(1) Can the lessor's insolvency administrator legally terminate the entire lease contract?

In certain jurisdictions, under certain relevant insolvency regime provisions, if the servicing is a core component of the lease contract, the lessor's insolvency administrator has the right to terminate the entire lease, and the issuer will not be entitled to receive lease payments following the lessor's insolvency.

(2) Can the lessor's insolvency administrator legally terminate solely the service component of the lease contract or the service contract itself?

If the right of the lessor's insolvency administrator only applies to the service contract or the service component of the lease contract, the exercise of this termination right will terminate the lessees' corresponding obligation to pay servicing fees but will not, in and of itself, affect the issuer's right to receive securitized lease payments.

(3) Will the administrator have an incentive to terminate the service component?

An administrator will likely have no incentive to terminate the lessor's servicing obligations if the continued provision of such services will benefit the insolvency estate. If this is not the case, the administrator may have an incentive to terminate the services, regardless of whether the insolvent entity is capable of performing the service obligations.

(4) Will the insolvent originator be able to perform the servicing functions?

Even if the insolvency administrator has no termination right in relation to the servicing component (or no incentive to exercise such right), it may not have the financial or operational ability to continue providing the contracted services to the lessee.

Factors relevant to this analysis include:

- Our assumption that a lessor who has systemic importance in the jurisdiction in which it operates may receive government support that will enable it to continue performing its services. The size and importance of originators are indicators of the likelihood of governmental support.
- Our consideration of whether a transaction benefits from structural features that would allow the services to the lessees to continue with a third party (on behalf of the lessor) following the lessor's insolvency. Examples include the appointment (before the lessor's insolvency) of backup service providers or other third parties that could facilitate the transition of relevant operations to other service providers.

(5) Does the non-performance or termination of the servicing component entitle the lessee to terminate the entire lease?

We review legal opinions covering the securitized lease contracts to assess under which conditions a lessee is entitled to terminate the lease contract. In particular, we assess whether termination or non-performance by a lessor of its servicing obligations would constitute a "good cause" for the lessee to terminate its lease. For this purpose, the relevant questions include:

- Could the termination or non-performance of the servicing component have a significant adverse effect on lessees?
- Are third parties capable of performing the services?
- Will the servicing fees under the lease contract (which will be retained by the lessee following the termination of the servicing component) be sufficient to pay for a third party to provide the services?
- Will the lessee be able to continue operating the lease object without the servicing component provision?
- Do the services have a value to the lessee that is independent of the leased asset?
- What is the size of the servicing fees relative to lease payments?

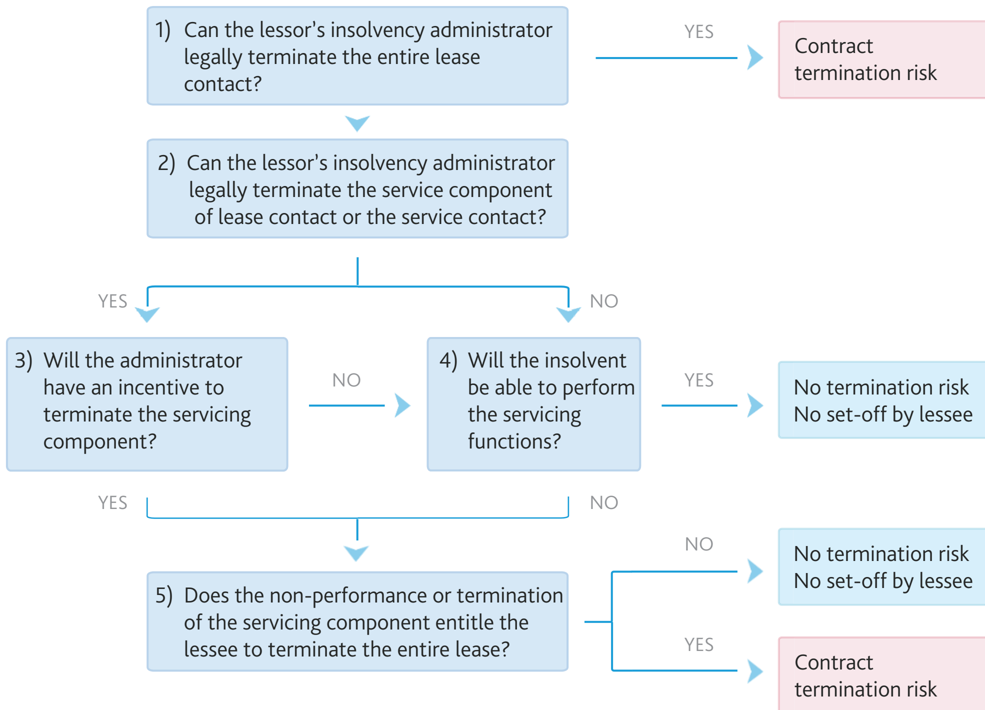
(6) Lessee set-off rights related to service obligations

Even if the risk of lease termination is remote, there may be a material risk that lessees will exercise a right of set-off arising from the termination or non-performance of the lessor's service obligations. Potential set-off rights arising from other claims of lessees against the originator are not considered here.

Where the termination or non-performance of the lease's service component leads to the lessee incurring servicing costs in excess of the contractual servicing fees, the lessee may set off the additional costs against its lease installments payable to the issuer. The presence of specific clauses in the lease contracts may reduce set-off risk but does not exclude it. We assume that an identifiable servicing fee in the lease installment payable by the lessee can be retained by the lessee if the services are not provided. If the service component is an integral part of the lease installment payable by the lessee (the total amount of which may not be easily broken into the constituent components), we may conduct additional analysis to address this potential risk.

Where applicable, we may estimate set-off exposure by assessing the costs likely to be incurred by the lessees to receive similar services for a fixed monthly fee from other third parties. We assess the likelihood of set-off risk in accordance with Exhibit 9. In some cases, we may view the risk as immaterial relative to the securities' target rating. If we determine that there is a material set-off risk for a particular transaction, we will model the effect of set-off, taking account of all relevant factors, including the rating of the originator, the likely amount of set-off exposure, and the amount of credit enhancement.

EXHIBIT 9
Analysis of Lease Contracts with Servicing Components



Source: Moody's Investors Service

Appendix 6: Contract Valuation Risks

Some of the underlying contracts in an equipment-backed transaction may be valued in the securitization at a discount rate that is lower than the contract's coupon rate. That is, the contract may be valued at a "premium" for the transaction. This can pose two risks to investors:

Asset Losses from Prepayments

If the premium contracts prepay, it creates an immediate loss in the transaction. For example, a 60-month, 7% contract with a $10,000 balance would have a securitized value of $10,492 when discounted at 5%. As a result, an immediate prepayment would lead to an asset loss in the transaction of $492 because the obligor pays $10,000 while the reduction in the securitization's asset pool is $10,492.

Another implication of this valuation method is that securitization recovery rates will be less than reported non-securitization recoveries using the implicit yield approach because any recovery amount is a lower percentage of the higher valuation created by using, the lower discount rate. For example, suppose the recovery on a defaulted lease with a balance of $1,000 (calculated using the implicit yield) is $300, for a recovery rate of 30%. If this contract were included in a securitization (and the cash flows were discounted at a lower rate), the value of the contract would be higher, say $1,100. The dollar amount of the recovery remains the same ($300), but the recovery rate falls to 27%.

Less "Skin in the Game"

A higher valuation means that the contract creates less excess spread within the securitization than it otherwise would and, therefore, less protection for investors against losses on the asset pool. The higher valuation also means that the originator earns an immediate profit from the lease rather than realizing it gradually over the life of the lease from excess spread. That reduction in "skin in the game" may reduce the originator's incentive to expend resources to service those contracts, potentially resulting in higher losses on the pool and greater risk for investors.

Premium valuation of equipment-backed contracts typically arises when originators discount the cash flows from all the loans in the pool at a single, uniform discount rate instead of applying each contract's rate to the individual contract's cash flows. For example, some originators value equipment loans within a securitization by discounting the cash flows at a (single) rate set equal to (or higher than) the weighted average coupon of the collateral pool. Alternatively, for some lease transactions, the discount rate used for valuation purposes is set equal to a rate that covers the sum of the securitization interest rate plus the transaction's expenses (e.g., trustee and servicing fees), which is typically lower than the rate implicit in many, if not all, the leases in the pool. In either case, those contracts that have a coupon rate higher than the securitization's discount rate will be valued at a premium.

Risk Evaluation

To evaluate the risk that the prepayment of high-coupon contracts could cause material pool losses, we examine the extent to which individual contracts in the pool are valued at a premium. This depends on how the originator sets the transaction's discount rate and on the distribution of the interest rates of the contracts within the pool. In cases in which there are many contracts with significant premiums, we may adjust our modeling results qualitatively for the potential negative effect that could be caused by prepayments on asset losses. In that analysis, we incorporate the potential mitigating impact of prepayment penalties, which are likely to discourage prepayments and, for those loans that do prepay, provide a source of funds to at least partially offset the losses that would otherwise occur. We also account for the potential mitigating effects of prepayments of contracts that have rates lower than the transaction's discount rate (which could result in a "gain" for the securitization).

We also evaluate the risk that the incentives for quality servicing may be weakened if contracts are valued at a premium (i.e., if the servicer has less "skin in the game" because profits are recognized immediately rather than over time through excess spread). In that evaluation, we assess the transaction's overall incentives – including any remaining potential future excess spread – for the originator to expend resources to service the contracts.

Appendix 7: Sovereign Risk

Loss Distribution Curve Accounts for Changes in Probability of High Loss Scenarios

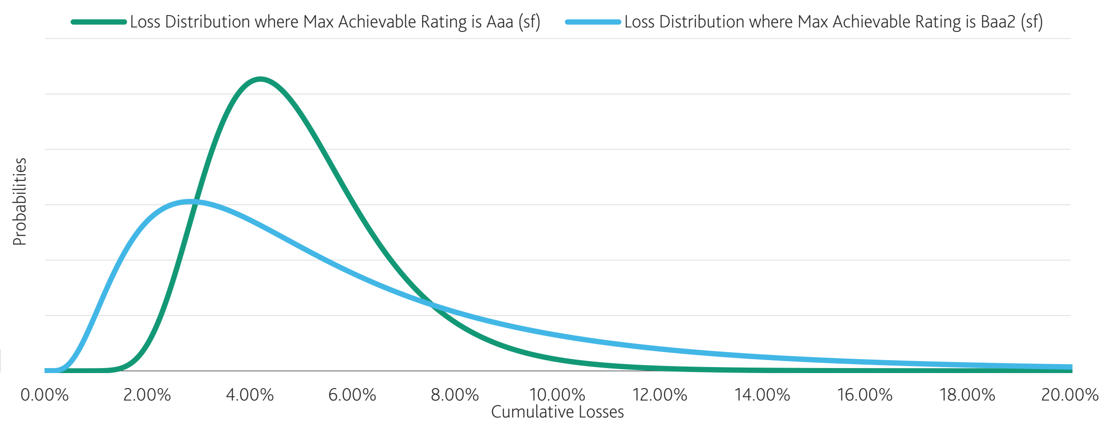
The modeling approach for equipment-backed transactions usually takes into account the country's local currency country risk ceiling (LCC) when calibrating the portfolio loss distribution, which we use to generate portfolio losses. In particular, we typically define the portfolio credit enhancement as the credit enhancement consistent with the highest rating achievable in the country (i.e., the LCC). In certain circumstances, in particular, for low LCC levels, we may consider alternative loss distribution assumptions or may not adjust our loss distribution assumptions taking into consideration the LCC.

As Exhibit 10 shows, two loss distributions reflecting the same amount of portfolio credit enhancement but different maximum achievable ratings will have markedly different shapes, meaning the losses and their associated probabilities differ markedly. The loss distribution for a maximum achievable rating of Aaa (sf) has a lower probability of very high loss scenarios than the loss distribution for a maximum achievable rating of Baa2 (sf).

EXHIBIT 10

Calibration of Credit Enhancement to Aaa (sf) vs. Baa2 (sf)

Same Portfolio Credit Enhancement for Different Country Ceiling Levels



Source: Moody's Investors Service

Under this approach, if we lower the maximum achievable rating for structured finance transactions in a country, we will not necessarily lower the amount of credit enhancement. For example, if a maximum achievable rating of Aaa (sf) previously corresponded to 10% credit enhancement, a new maximum achievable rating of Baa2 (sf) may also correspond to 10% credit enhancement to account for the risk of a higher probability of high loss.

When we calculate the loss distribution using the same enhancement amount but a lower rating, the result is a fatter tail on this curve. This distribution takes into account the higher probability of high losses on the rated security in a country with a lower ceiling.

This approach provides for a consistent stress across the capital structure, from the senior to the junior classes. The revised loss distribution will capture a change in country risk level and resulting changes in the maximum achievable rating or the relevant credit enhancement (for junior securities).

Minimum Portfolio Credit Enhancement

Furthermore, for transactions issued in countries where information availability limits the predictability of severe stress, our equipment ABS analysis also considers additional features. Specifically, we may subject the CE consistent with the highest rating achievable in a given market to a floor: the minimum portfolio CE. This floor mitigates general market factors such as system-wide event risk and asset correlation, which could lead to high losses in the pool in the event of extreme stress despite overall good asset quality. We will set the minimum portfolio CE level at different levels for each affected country and asset class to reflect the underlying economic uncertainty of the asset class in the specific market.

We generally determine the minimum portfolio CE levels for each country as a function of the potential deterioration arising from macroeconomic, social, or political events that would affect all portfolios originated in a particular jurisdiction, regardless of (1) the strength of an originator's origination and underwriting processes, (2) the type of obligors in a portfolio, or (3) the characteristics of the underlying security the obligors provide. We apply such minimum portfolio CE levels as long as we assume that those conditions will prevail.

Appendix 8: Security Interest in the Underlying Equipment in the US

Ownership Interest or Security Interest in the Underlying Equipment

If the collateral is a lease, we examine whether the originator or the seller) of the lease has the proper ownership interest in the underlying equipment (as in the case of a true lease) or a perfected security interest in the underlying equipment (as in the case of a lease intended as security). Under the Uniform Commercial Code (UCC) in the US, a lease is either a true lease or a lease intended for security.

For a true lease, also called a tax lease, under which the lessor bears the risk of ownership, we examine whether the originator has properly sold the leased equipment to the issuing entity and whether the originator, as a precautionary measure, has filed a UCC financing statement to safeguard its security interest in the leased equipment if the lease were to be reclassified as a lease intended for security.

For a lease intended for security (similarly to a loan), we examine whether the originator has properly granted or assigned its security interest in the equipment to the issuing entity.

Perfection of Security Interest in the Underlying Equipment

We also analyze if the security interest in the underlying equipment is perfected by appropriate means. In the US, the security in the underlying equipment (other than transportation equipment subject to certificate of title statutes) is usually achieved through the filing of financing statements.

If the underlying equipment is a vehicle, state law governs the means for perfecting the interest. Most state motor vehicle regulations provide for certificates of title with the notation of the holder of a lien against the vehicle, but state law may differ. Consequently, our analysis focuses on the states with the largest exposures and assesses how the security interest in the underlying equipment is perfected in those states.

Security Interest in the Underlying Equipment upon Sponsor or Lessee Bankruptcy

A first priority perfected security interest in the underlying equipment for the ABS investors is critical for recovery in the event of either sponsor or lessee bankruptcy. In a sponsor bankruptcy, the leases and the equipment in a securitization could be consolidated with the estate of the bankrupt sponsor if the true sale is re-characterized as a financing transaction. Having a first priority perfected security interest in the underlying equipment places the ABS investors in a better position for recovery versus the bankrupt sponsor's unsecured creditors. This is equally true in the event of a lessee bankruptcy.

Having a first priority perfected lien in the underlying equipment is especially important to securitizations backed by medium-sized or large-ticket equipment because recovery has a significant impact on the ultimate loss; it is less important for small-ticket equipment securitizations in light of the low recovery rate for such equipment and the administrative burden to secure a first priority perfected security interest in the underlying equipment. We consider a first priority perfected security interest in the underlying equipment an important factor in our recovery rate analysis.

Appendix 9: Multi-Pool Finance Lease Transactions in Europe

Finance lease securitizations in Europe are often backed by multiple pools of assets, including auto vehicles, machinery, industrial equipment, and even real estate, which often constitutes a large portion of a pool. The obligors in these transactions are typically individual entrepreneurs and small and medium-sized enterprises (SMEs). We, therefore, adjust our general approach to take into account the variety of leased assets and the real estate exposure.

Exhibit 11 shows the main characteristics of the multi-pool lease-backed transactions in Europe.

EXHIBIT 11

Main Characteristics of EMEA Multi-Pool Lease-Backed Transactions

Type of originator	Either "generic" (such as retail/commercial banks) or specialized lender
Type of borrower	Mostly SMEs and some individual entrepreneurs/self-employed
Financing purpose	To acquire an asset generally instrumental to the borrower's business
Type of financed assets	Vehicles (e.g., auto vehicle, trucks), equipment (e.g., machinery, industrial equipment), and real estate
Contract amortization	Mostly French amortization
Lease term	From 2 to 5 years for non-real estate assets and 10 to 18 years for real estate assets
Borrower concentration	Limited concentration, with the largest borrower concentration rarely higher than 1.5%
Industry diversification	The largest industry (i.e., borrower sector) generally constitutes 20%-35% of the portfolio; in the majority of the cases, construction and building
Geographical diversification	The majority of the pool tends to be concentrated in the most industrialized regions of the country (i.e., Lombardy for Italy and Madrid or Catalonia for Spain)

Source: Moody's Investors Service

Default Rate Analysis

The different asset types in a European multi-pool transaction typically have different default profiles. We analyze potential defaults for each asset type separately and then combine the results by weighting each based on the size of each sub-pool.

When available, we use historical data on similar pools to assess the default profile of each asset type sub-pool. We complement the pool analysis with a top-down individual asset analysis. In applying the individual asset approach, we might adjust for the asset type to account for the different default behavior of asset types such as real estate, medical equipment, autos, and office equipment.

Recovery Rate Analysis

In our recovery rate analysis, we take into account empirical evidence that shows recovery rates vary by asset type. Differences in recovery rates are often due to the differences a) in appreciation or depreciation rates for different asset types and b) in the liquidity provided by the secondary markets for the assets. For example, non-real estate assets tend to depreciate over time, but real estate assets such as offices and warehouses typically maintain a minimum value throughout the economic cycle, and their recovery values are therefore higher. Furthermore, non-real estate assets subject to rapid technological obsolescence (such as computers) and that are difficult or costly to transfer to new users tend to depreciate more quickly and are more illiquid than other non-real estate assets. Our recovery rate analysis also takes into account that the equipment for an SME obligor in a leased-backed transaction is typically essential for the ongoing viability of the SME's business, and therefore the obligor has a strong incentive to voluntarily make recovery payments acceptable to the lessor.

As part of our recovery rate analysis, we review historical cumulative recovery rates by vintage originators provide for pools whose characteristics are largely in line with those of the securitized pool. In addition, we review any historical individual-asset loss-given-default data the originator provides. Typically, our analysis separates the major components of the pool: real estate,[38] autos, and other equipment.

[38] For more information, see also the relevant sections in our approach to rating SME balance sheet securitizations. A link to a list of our sector and cross-sector methodologies can be found in the "Moody's Related Publications" section.

Appendix 10: Assumption Revisions over the Life of an EMEA Equipment Lease- and Loan-Backed Transaction

As part of our ongoing surveillance of EMEA equipment lease- and loan-backed transactions, we use transaction-specific performance data to help revise our expected default or loss assumptions during the transaction's life. The transaction-specific data we consider generally includes:

- delinquency rates and trends
- observed periodic and cumulative default or loss rates (Sometimes loss rates are reported instead of default rates. The entire approach to revising the expected default assumption described in this report also applies to revise the expected loss assumption.)
- historical portfolio redemption rates, which can often be separated into scheduled redemption and prepayments

In the early months of a transaction's life, we typically maintain our initial expected default or loss assumption unless we observe signs of material deviation in performance. More weight may be given to the transaction performance data the more the transaction is seasoned. When significant transaction-specific performance information is available, the payment patterns exhibited by the portfolio can be better performance predictors than loan-level or portfolio characteristics, in particular when forecasting future defaults considering our baseline projected economic outlook.

We also incorporate benchmarking analysis and other qualitative considerations when reassessing our expected default or loss estimates. For example, we may complement our analysis by reviewing performance indicators such as the evolution of the securitized portfolio delinquency trend or the distance between the observed defaults or losses and our expected default or loss assumption for the life of the transaction. In case of significant deviation of observed defaults or losses to our assumed level, we would adjust our expected loss or default assumption and may adjust further to acknowledge the observed deviation.

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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