

# Methodology

## Rating CLOs Backed by Loans to European SMEs

### DBRS Morningstar

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### Related Research

For a list of the Structured Finance related methodologies for our principal Structured Finance asset class methodologies that may be used during the rating process, please see the DBRS Morningstar Global Structured Finance Related Methodologies document on [www.dbrsmorningstar.com](http://www.dbrsmorningstar.com). Please note that not every related methodology listed under a principal Structured Finance asset class methodology may be used to rate or monitor an individual structured finance or debt obligation.

### Key Updates

For key updates in this methodology, please refer to the press release titled *DBRS Morningstar Publishes Updated Rating CLOs Backed by Loans to European SMEs Methodology* dated 30 September 2020.

### Scope and Limitations

A methodology sets forth the key analytical considerations and applicable analytics used when DBRS Morningstar assigns or monitors credit ratings or other opinions. DBRS Morningstar applies approved methodologies in the evaluation of a structured finance transaction or debt obligation. Quantitative and qualitative factors set forth in a methodology or in a combination of methodologies are evaluated by a DBRS Morningstar rating committee or discussion group that exercises analytical judgment and considers the regulatory environment, market standards and customary practices in addition to other factors deemed relevant to the analysis.

As part of the evaluation process, DBRS Morningstar may opine as to whether a sponsor's proposed capital structure supports the assignment of a given rating(s), the loss level(s) the capital structure is able to withstand or the rating level(s) supported by a sponsor's proposed capital structure. Once completed, this process facilitates the assignment of a DBRS Morningstar rating, at a given rating level.

In cases when an applicable methodology does not address one or more elements of a structured finance transaction or obligation, or such element(s) differs from the expectations contemplated when an applicable methodology was approved, DBRS Morningstar may apply analytical judgment in the determination of any related analytical factor, assumption, rating or other opinion.

For a methodology that incorporates the use of a predictive model, DBRS Morningstar may also depart from the rating stress(es) implied by the predictive model. DBRS Morningstar typically expects there to be a substantial likelihood that a reasonable investor or other user of the credit rating(s) would consider a three-notch or more deviation from the rating stress(es) implied by the predictive model to be a significant factor in evaluating the rating(s). When a rating committee determines a material deviation, DBRS Morningstar discloses the material deviation and its analytical judgment for the material deviation.

## Introduction

This report describes the methodology that DBRS Morningstar uses when rating SME CLO transactions. SME lending represents a significant proportion of the banking industry business. Securitisation of SME loans has long been established in some European countries as a key source of funding and liquidity for banks, as well as a tool for risk management. Under the guidance of the European Union, the definition of an SME includes not only micro, small and medium-sized enterprises, but also self-employed individuals (including entrepreneurs and artisans). As such, most SME CLO transactions contain a combination of loans granted to pure SMEs as well as to self-employed individuals.

The sections of DBRS Morningstar criteria for rating SME CLOs contained in this report are as follows:

1. Calculation of Stressed Default Rates at varying rating levels;
2. SME Recovery Rate Assumptions;
3. SME Asset Correlation Assumptions; and
4. Key Risks and Adjustments.

The legal framework and counterparty criteria used to analyse SME CLOs is found in the *Legal Criteria for European Structured Finance Transactions* methodology. The structural and cash flow analysis framework is found in the *Cash Flow Assumptions for Corporate Credit Securitizations* methodology. The treatment of derivatives used as hedges is described in DBRS Morningstar's *Derivative Criteria for European Structured Finance Transactions* methodology. Operational risk is assessed in accordance with the *Operational Risk Assessment for European Structured Finance Servicers* and *Operational Risk Assessment for European Structured Finance Originators* methodologies.

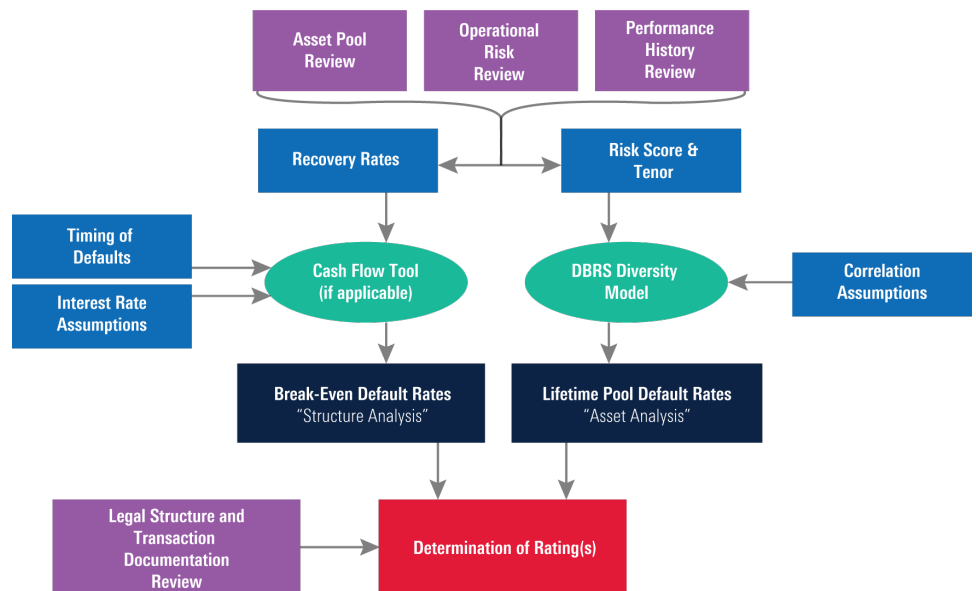
This approach is applied in conjunction with a number of other DBRS Morningstar publications, including the following:

- *Cash Flow Assumptions for Corporate Credit Securitizations*;
- *Legal Criteria for European Structured Finance Transactions*;
- *Master European Structured Finance Surveillance Methodology*;
- *Derivative Criteria for European Structured Finance Transactions*;
- *Rating CLOs and CDOs of Large Corporate Credit*;
- *Master European Residential Mortgage-Backed Securities Rating Methodology and Jurisdictional Addenda*;

- *European RMBS Insight Methodology and jurisdictional methodologies;*
- *Mapping Financial Institution Internal Ratings to DBRS Morningstar Ratings for Global Structured Credit Transactions;*
- *Operational Risk Assessment for European Structured Finance Originators;*
- *Operational Risk Assessment for European Structured Finance Servicers; and*
- *Interest Rate Stresses for European Structured Finance Transactions*
- *Currency Stresses for Global Structured Finance Transactions*

These methodologies can be found [here](#).

**Exhibit 1** DBRS Morningstar Rating Process for European SME CLOs



Source: DBRS Morningstar.

Exhibit 1 summarises the rating process for analysing a European SME CLO:

1. DBRS Morningstar assesses operational risk by evaluating the quality of the SME loan originator and servicer. An originator and servicer review is performed on relevant originators and servicers responsible for the origination or servicing of the underlying SME loan portfolio being securitised. Please refer to *Operational Risk Assessment for European Structured Finance Servicers* and *Operational Risk Assessment for European Structured Finance Originators* for more information on this process.
2. DBRS Morningstar reviews actual performance data of the SME loan originator and servicer with respect to historical defaults and recoveries. Alternatively, DBRS Morningstar conducts a mapping of the financial institution's internal rating system (IRS) to the DBRS Morningstar rating scale.
3. DBRS Morningstar reviews the data and information regarding the loans in the SME pool to be securitised.

4. Using the results from items (1) through (3), DBRS Morningstar determines an annualised probability of default (PD) of the SME pool and stressed recovery rates for various rating levels.
5. DBRS Morningstar generates lifetime pool default rates for each rating level (Stressed Default Rates) using the DBRS Morningstar Diversity Model based on the PD determined in (4) as well as the tenor, amortisation profile, industry and obligor distributions of the portfolio.
6. DBRS Morningstar performs a cash flow analysis on the structure by incorporating stress assumptions on the timing of defaults, interest rates and stressed recoveries from (4) as well as recovery delays. The tool determines the percentage of the portfolio collateral that can default without the tranche experiencing a loss (the Break-Even Default Rate).
7. DBRS Morningstar reviews the transaction's legal documentation and associated legal opinions for consistency with the *Legal Criteria for European Structured Finance Transactions* methodology.
8. DBRS Morningstar determines the rating of a particular tranche by comparing the Break-Even Default Rate (6) with the Stressed Default Rate (5) as well as considering the legal structure and transaction documentation proposed (7).

### **Determining Stressed Default Rates**

DBRS Morningstar conducts an analysis of stressed pool default rates for SME pools using a combination of current portfolio and/or historical performance data and information. DBRS Morningstar uses a Monte Carlo simulation model when analysing SME CLO portfolios to incorporate industry and obligor distributions when determining Stressed Default Rates.

### **DBRS Morningstar Diversity Model**

DBRS Morningstar employs a two-factor correlation model as the basis for SME default modelling. This correlation structure is implemented in the DBRS Morningstar Diversity Model, allowing for explicit concentration in obligor and industries, while using a Monte Carlo process to generate the Stressed Default Rates. The model takes into account several inputs:

1. Asset-specific PD or obligor long-term rating or pool-wide PD;
2. Pool characteristics;
3. Two-factor correlation parameters by rating stress level;
4. Tenor of the pool (adjusted for reinvestment period, if applicable);
5. Individual loan size and industry (DBRS Morningstar industry codes can be found in Table 1);  
and
6. Individual loan amortisation schedules or tenor.

### **Probability of Default**

DBRS Morningstar typically uses one of the following two methods to estimate the PD of an SME portfolio: the "historical performance" approach and the "internal ratings mapping" approach.

### *Historical Performance*

DBRS Morningstar may calculate the PD for the portfolio of risky assets based on the originator's historical performance data for similar assets. The historical information received generally contains performance data for the past five to ten years. DBRS Morningstar considers the following factors in determining the number of years of historical data for its PD analysis: portfolio composition by origination date, changes in origination practices used by the originator and other factors that enable DBRS Morningstar to determine if older information still reflects the current credit risk of the portfolio.

DBRS Morningstar expects to receive default data by cohort (i.e., loans grouped by origination period). For each cohort, DBRS Morningstar expects to receive both the number and par amount of all loans, defaults, prepayments, scheduled repayments and recoveries outstanding over time. In the case that loans can be broken down into sub-sections such as borrower size (e.g., medium, small and micro, either according to the originator's internal definition or by the European Central Bank's definitions) or collateral type (secured or unsecured), DBRS Morningstar may consider default data by loan type.

If cohort data provided to DBRS Morningstar does not include data organised by number of loans, DBRS Morningstar may apply additional stresses in calculating a PD. DBRS Morningstar has determined that the PD based on the notional for a general pool of loans that are regarded as SMEs may be misleading because the variance in borrower size and default rate may skew the average PD.

An SME historical default rate analysis is primarily an asset-backed security-based analysis that assumes a uniform default rate for a portfolio of assets rather than a specific default rate for any individual asset or obligor. Such an assumption can be made only if the portfolio exhibits a minimum level of diversification and granularity and the characteristics of the portfolio selected are similar to the loan book of the originator.

There may be certain instances, however, when the portfolio selection criteria may result in a portfolio that differs from the loan book data, which may further result in portfolios that exhibit better or worse credit quality than the loan book (such criteria resulting in either positive or negative selection, respectively). Such adjustments are discussed further in the section entitled Positive or Negative Selection.

Once DBRS Morningstar determines the originator's long-run historical PD, adjustments may be made to consider specific characteristics of the SME pool in order to calculate the portfolio Stressed Default Rates.

### *Internal Ratings Mapping*

For loans originated by financial institutions with Internal Ratings Based (IRB) approved models, DBRS Morningstar may alternatively conduct a mapping of the financial institution's internal rating system (IRS) to the DBRS Morningstar rating scale, as described in the *Mapping Financial Institution Internal Ratings to DBRS Morningstar Ratings for Global Structured Credit Transactions* methodology.

### *Portfolio Evaluation*

A loan portfolio is typically segregated into sub-pools with common characteristics to allow for stratifications that permit the analysis of common risks. The stratifications are analysed by DBRS Morningstar to check that they accurately capture the common characteristics necessary to assist in the risk analysis. Characteristics that are isolated for analysis may vary based on the type of asset and overall composition of the pool but usually include obligor, industry and geographic concentrations. The overall characteristics of the pool are then determined by aggregating those of each subset together, weighted by the relative notional of each group.

### *Default Definition*

A payment default occurs when the borrower, after any applicable grace period, is either unable or unwilling to make its payment obligation under a loan. DBRS Morningstar uses the default information to develop its base case expectation for the portfolio's performance as well as the starting point for application of stress scenarios of static and annual pool losses.

DBRS Morningstar generally considers a loan to be in default if it is more than 90 days past due (dpd). This is the same definition employed by the Bank of International Settlements under its Basel III regulation; however, DBRS Morningstar recognises that national supervisors have discretion in determining default definitions and that certain jurisdictions may use a different default definition that would affect historical performance data. As such, DBRS Morningstar may, on a country-by-country basis, use a different definition of default, such as 180-plus dpd, if there is evidence that the 90-plus dpd definition is not an accurate indicator of ultimate default (for example, if a consistently high cure rate is observed after the 90 dpd).

### **Correlation**

To take into account the increased concentration risk inherent in SME pools because of obligor and industry, DBRS Morningstar applies a rating level-based correlation stress using the DBRS Morningstar Diversity Model. DBRS Morningstar has updated its correlation assumptions for SME CLOs. The new correlations are based on a historical analysis of European SME CLO portfolio performance. For the purposes of the model, intra- and inter-industry correlations are assumed to be the levels in Table 3.

### **Asset Tenor**

The portfolio tenor is determined in the base case, but may be adjusted to account for flexibility that is allowed for in the transaction. Generally, for static SME pools, this is the weighted-average life (WAL) of the assets without accounting for unscheduled prepayments, but taking into consideration the amortisation schedule of each asset. For revolving pools, DBRS Morningstar may calculate the tenor as follows: for transactions in which the reinvestment period does not have an early default trigger, the tenor is calculated by adding the length of the revolving period to the WAL covenant at the end of the reinvestment period; for cases where the revolving period would be interrupted once defaults reach a certain level, the tenor may be calculated as the WAL covenant, assuming that the default trigger has been breached (i.e., the transaction is static); and in transactions where a number of assets have significantly shorter WALs than the remainder of the portfolio, DBRS Morningstar may perform a roll-forward analysis to evaluate the WAL once these assets have matured.

### **Asset Amortisation Schedule**

The amortisation schedule for each individual loan is taken into account in the DBRS Morningstar Diversity Model. Each loan's PD simulation produces a period of default based on its hazard rate. For each loan that defaults, the model will determine the exposure at default (EAD) based on each loan's amortisation schedule. For example, if a loan has a balance of EUR 100 with a pay down of EUR 10 in each year and the loan defaults during Year 5, it will only default EUR 60 of par.

### **Forecasting Rating-Based Stressed Default Rates**

Given a probability distribution of outcomes, rating-based percentiles of that distribution are used by the DBRS Morningstar Diversity Model to calculate Stressed Default Rates at varying rating levels. These percentiles are calculated based on the DBRS Morningstar Idealised Default Table located in Table 2 of Appendix A.

For pools with large obligor concentrations, DBRS Morningstar may choose to have DBRS Morningstar Credit Estimates<sup>1</sup> assigned to such obligors.

PDs based on the tenor and DBRS Morningstar Credit Estimate for these large concentrations are combined with the probability for the remainder of the overall pool and are used to determine the Stressed Default Rates.

### **Recovery Rates for Loans to SMEs**

When performing cash flow analysis for CLOs, DBRS Morningstar determines expected recovery rates based on borrower domicile, loan seniority and the availability of collateral secured by mortgage collateral.

### **Unsecured Recovery Rate**

For assets that are unsecured or are secured by collateral other than real estate, DBRS Morningstar applies recoveries for the applicable rating and country tier in line with its *Rating CLOs and CDOs of Large Corporate Credit* methodology.

### **Secured Recovery Rate**

For assets secured by residential or commercial real estate, market value decline (MVD) assumptions are applied to the collateral value, with the resulting stressed value available for loan repayment. In the case of multiple loans or liens, DBRS Morningstar considers all available data and computes the appropriate recovery. The resulting recovery rate is floored at the Senior Unsecured recovery rate for the applicable rating and country tier.

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<sup>1</sup> A DBRS Morningstar Credit Estimate is a model-driven PD and is not equivalent to a DBRS Morningstar Public Rating. Credit Estimates are not monitored and typically expire one year after assignment. A description of the DBRS Morningstar Credit Estimate model and additional information is available on [www.dbrsmorningstar.com](http://www.dbrsmorningstar.com).

### **MVD and Distressed Sale Discount Assumptions for Residential Mortgage Backed Loans**

Recoveries are calculated by first indexing the original collateral value using a published home price index within the relevant jurisdiction, applying an MVD and finally applying a distressed sale discount (DSD). Residential indexes, MVD and DSD assumptions for assets secured by residential real estate can be found in DBRS Morningstar's residential mortgage-backed securities (RMBS) methodology for the relevant jurisdiction.

### **MVD Assumptions for Commercial Mortgage Backed Loans**

DBRS Morningstar applies a general MVD assumption across Europe for commercial real estate collateral<sup>2</sup>. The commercial real estate MVD assumptions are intended to be higher than the MVDs used for residential real estate assets to reflect the higher price volatility of these assets as a result of lower liquidity, heterogeneity of property types and purpose constrains.

Commercial real estate MVDs are applied to industrial real estate assets such as factory plants, warehouses and industrial compounds as well as commercial real estate assets such as hotels, hospitals, large commercial surfaces (supermarkets, shopping centres, parking lots, etc.), retail units (shops), restaurants, bars and offices. DBRS Morningstar usually applies the commercial MVDs to land used for agricultural purposes, while loans secured by land for real estate development are typically considered unsecured. Commercial and industrial properties securing SME loans typically differ from those used in commercial mortgage-backed transactions (CMBS): they are smaller (as per the European Commission SME definition, a company exceeding 43 million of total assets is not classified as SME) and the borrower generally operates the properties, while properties included in CMBS tend to be leased to third parties.

Commercial MVDs are analysed using a peak-to-trough approach and therefore, DBRS Morningstar accounts for situations where prices have corrected significantly from the peak by indexing property values to account for relevant price movements. However, the benefit given to property price corrections is capped so that a minimum level of MVD is incorporated at each rating level stress. DBRS Morningstar considers the most updated collateral valuation; but if the most recent valuation date is considered stale, DBRS Morningstar may not give credit to property price corrections and may apply further additional stresses. From time to time, DBRS Morningstar may depart from these assumptions based on originator historical data.

In countries where there is limited availability of robust commercial property price indices, DBRS Morningstar uses a residential property value index as a proxy for movements in commercial property prices<sup>3</sup>.

	<b>AAA</b>	<b>AA</b>	<b>A</b>	<b>BBB</b>	<b>BB</b>	<b>B and below</b>
Commercial MVDs (Applied on updated valuation indexed to the peak)	80%	75%	70%	65%	60%	55%
Commercial MVDs Floor (Minimum MVD applied on updated valuation)	70%	65%	60%	55%	50%	45%

<sup>2</sup> Even though Commercial MVDs are the same across Europe, recovery rates for commercial mortgage loan portfolios differ between countries given that the resulting recovery rate is floored at the Senior Unsecured recovery rate for the applicable rating and country tier.

<sup>3</sup> For countries where relevant residential and commercial property price indices are available, DBRS Morningstar concluded there is a high correlation between residential and commercial property prices.



**Figure 1 - step-by-step example to derive the collateral recoveries for a commercial property**

In the following example, DBRS Morningstar assumes a mortgage loan is secured by a commercial property with an updated valuation of EUR 200,000. Comparing the relevant property index and the current valuation date of such asset, DBRS Morningstar calculates that the property has experienced a decrease of 33.3% from the peak, which means that the value at the peak was EUR 300,000. The first step to derive collateral recoveries is to apply the MVD found in the table above to the peak value of the property (a). The second step is to calculate the maximum collateral value that DBRS Morningstar gives credit to in such scenario by applying the MVD floor to the current collateral valuation (b). The collateral recoveries assumed by DBRS Morningstar in a AA scenario are equal to the lower of the two values (c).

Updated Collateral value = EUR 200,000

Updated Collateral value indexed to the peak = EUR 300,000 (index at the peak is 1.5 times the current index)

A. Collateral Recoveries with valuation indexed to the peak (AA scenario) = EUR 300,000 \* (1 – 75%) = 75,000

B. Maximum Collateral Recoveries (AA scenario) = EUR 200,000 \* (1 - 65%) = EUR 70,000

C. Gross Collateral Recoveries (AA scenario) = Min [EUR 70,000 ; 75,000] = EUR 70,000

The next step is to calculate the recovery rate based on the loan balance. For this example, DBRS Morningstar assumes the outstanding loan balance is EUR 120,000 (LTV of 60%), the foreclosure costs are 8% of the loan value (floating costs) and a fixed cost of EUR 5,000. The net recovery amount is equal to EUR 55,400 (EUR 70,000 – EUR 5,000 – (EUR 120,000 \* 8%).

The final recovery rate is equal to 46.2% (EUR 55,400 / EUR 120,000).

**Foreclosure Costs**

Foreclosure costs are the costs associated with the sale of a property through a foreclosure process. These may include legal fees, property maintenance fees, auction fees and transfer fees. The cost structure associated with a property sale typically includes both a fixed and variable component. Variable costs may be based on either the property value or outstanding loan balance. Variable costs for the property value are based on the sale price after adjusting the indexed property valuation for the MVD. For residential properties, foreclosure costs are estimated for each jurisdiction and are constant across all rating scenario stresses. They can be found in the RMBS methodology for the relevant jurisdiction on [www.dbrsmorningstar.com](http://www.dbrsmorningstar.com).

If historical data on foreclosed commercial properties is provided by the originator(s), DBRS Morningstar may use such data to form assumptions on foreclosure costs; otherwise, DBRS Morningstar typically uses the same assumptions determined for residential properties and may apply further stresses depending on the portfolio characteristics.

### **Second-Lien or Lower-Ranking Security**

It is not uncommon for SME loans to include a second or lower ranking security over a mortgage. As a borrower pays down its loan and the current LTV decreases, a portion of the original mortgage security can be released and a new loan benefitting from a lower ranking mortgage on the same property can be granted, thus allowing the borrower and the bank to optimise the amount of collateral available.

DBRS Morningstar can analyse expected recovery proceeds arising from second or lower ranking mortgages only in cases where it has received sufficient data and information to be able to estimate the residual recoveries proceeds to be allocated following payment of all senior claims or prior charges associated with the collateral. This additional data and information typically includes, for each loan, the total amount of prior (or senior) charges on the property and amounts of each mortgage inscription. DBRS Morningstar conducts the same MVD approach and applies the recoveries first to meet in full all prior obligations and then to determine what (if any) amounts remain to satisfy the amounts due on the securitised loan. In cases where the data provided is incomplete or insufficient to reasonably estimate all the prior charges, DBRS Morningstar treats such loans as if they were unsecured and applies the relevant unsecured recovery rate assumption.

### **Security Available at Borrower Level (All Sums Security)**

In certain cases, the real estate collateral is charged against all of the outstanding as well as future obligations of a borrower (typically on a *pari passu* and *pro rata* basis, sometimes referred as an “all-sums approach”), as opposed to the more frequent situation where the security interest over real estate assets is created for the benefit of specific exposures only. This approach is market practice in jurisdictions such as Germany and Belgium mainly for tax and cost effective purposes. In a few instances, DBRS Morningstar has come across a similar concept being implemented by financial institutions in jurisdictions where this is not common practice.

The analysis of all-sums security is complex and warrants a review of the legal framework, proposed terms (including, *inter alia*, the effective transfer of such security to the securitisation issuer) and available data. Of the proposed terms, DBRS Morningstar focuses on the inclusion and enforceability of provisions regarding preferential allocation of recoveries and subordination of claims of any future advances to those already in existence at transaction closing.

### **Recovery Delay**

Following an event of default under a loan, the servicer’s obligations do not cease but rather become more focused toward attempting to recover the defaulted loan balance by liquidating collateral (in the case where the transaction has an explicit security interest on such collateral), borrower negotiation or through the bankruptcy process. DBRS Morningstar reviews the transaction documents to check that the servicer has rights under the underlying documents to effect recovery and the transaction has clear rights to amounts recovered.

In general, recovery timing is assumed to vary according to the domicile of the obligor. These recovery delays were determined by examining the average time to resolve insolvencies as well as the legal framework regarding relative debtor/creditor friendliness in a particular jurisdiction. Please refer to the *Rating CLOs and CDOs of Large Corporate Credit* methodology for country tiers and

delays for unsecured recoveries as well as the applicable RMBS methodology for the residential real estate recovery timing for the relevant jurisdiction. Recovery delays for commercial real estate are assumed to be equal to the residential ones, considering the similarities between the repossession proceedings. When assessing recoveries on a loan secured by residential or commercial real estate, DBRS Morningstar applies a fraction of the recovery equal to the unsecured amount at the unsecured delay, followed by the balance of the recovery at the relevant recovery delay. For example, DBRS Morningstar assumes the unsecured recovery delay is one year, the unsecured recovery rate is 13.5%, the secured recovery delay is four years and the secured recovery rate is 40%. In this example, DBRS Morningstar assumes 13.5% of the loan outstanding balance is received after one year from default and the remaining 26.5% is recovered after four years from default.

### **Evaluation of Transaction Structure**

DBRS Morningstar compares the projected Stressed Default Rates generated by the DBRS Morningstar Diversity Model with the tranche's Break-Even Default Rate generated by a cash flow tool in order to determine the rating of the tranche. For more details on the calculation of a tranche's break-even default rate and cash flow stress scenarios, please refer to the *Cash Flow Assumptions for Corporate Credit Securitizations* methodology.

In addition to its quantitative analysis, DBRS Morningstar reviews the transaction's legal documentation for consistency to the *Legal Criteria for European Structured Finance Transactions* methodology.

### **Key Risks: Analysis and Adjustments**

While credit risk is the main risk factor affecting the performance of SME CLO transactions, there are several other factors that can have a significant impact on the performance of the rated notes. The following subsections highlight and outline DBRS Morningstar analysis of the most common risks present in SME CLOs. The majority of these risks are outlined in other criteria, such as DBRS Morningstar's *Legal Criteria for European Structured Finance Transactions* and *Derivative Criteria for European Structured Finance Transactions* in a more generic form; therefore, the focus of this section is the impact of each of those risks specifically regarding SME CLOs.

#### **Set-Off**

Set-off risk is more prevalent in an SME CLO transaction compared with other asset securitisations. This is because of the nature of the borrower and product type, which consists of larger loan balances and because of the larger deposit balances each borrower holds within the same banking institution as compared with other asset classes, such as residential mortgages or credit cards. As such, mitigating mechanisms akin to deposit protection schemes provide only partial protection against set-off in SME loan lending.

To calculate the amount of potential set-off exposure, DBRS Morningstar requests that originators supply information related to amounts held in deposit accounts at the same banking institution and the marked-to-market value of any derivatives on all borrowers whose loans would form part of the securitisation. DBRS Morningstar calculates the set-off amount and uses this in its cash flow

analysis by considering deposit protection schemes available in each jurisdiction, the legal framework regarding set-off in each jurisdiction and any additional mechanisms or mitigants available at the transaction level.

There are several ways to mitigate set-off risk and DBRS Morningstar considers any proposal. Typically, the set-off is mitigated by a dedicated reserve account funded at closing, a contingent reserve account funded upon the downgrade of the originator's long-term rating below a specific level or the inclusion of additional assets.

If the transaction does not have a separate mitigant for set-off risk, DBRS Morningstar may make deductions to the portfolio to fully or partially address the set-off risk amount from the portfolio, depending on the jurisdiction, severity of the set-off risk and the rating level assigned to the most senior class of notes.

### **Commingling**

Commingling risk occurs when the servicer defaults and (1) money that has been paid to the servicer cannot be transferred to the transaction in a timely manner and (2) borrowers continue to pay the servicer. Under both scenarios, the money is lost to the transaction. At best, this is a liquidity issue and the money will eventually be paid to the transaction. At worst, the money becomes part of the estate of the servicer and is lost permanently.

DBRS Morningstar may apply stresses to transactions where commingling risk poses a risk to the transaction's continuing performance. DBRS Morningstar stresses are commensurate with the potential credit risk to the transaction based on the factors above. As with the set-off analysis, the mitigants can be a pre-funded or a ratings-dependent reserve. If there is no mitigant or if the mitigant is regarded as being insufficient, DBRS Morningstar may make deductions to any other reserve accounts in the transaction or, if necessary, to the portfolio.

### **Interest Rates**

DBRS Morningstar's *Derivative Criteria for European Structured Finance Transactions* addresses the use of derivatives in structured credit transactions. In addition, the *Cash Flow Assumptions for Corporate Credit Securitizations* methodology specifies the modelling parameters that DBRS Morningstar uses when analysing a transaction. For interest rates in particular, DBRS Morningstar is concerned to the extent that the transaction Break-Even Default Rates vary as interest rates change. In general, a transaction is exposed to interest rate risk from a mismatch between (1) the interest rate indices on which the liabilities pay and those which the assets pay, or basis risk; (2) the dates that the assets and the liabilities reset their indices; and (3) the fixed/floating percentage of the assets compared with the liabilities. In addition, there can be a currency mismatch layered on all these risks. DBRS Morningstar will model interest rates and interest rate stresses according to the approach described in DBRS Morningstar's *Interest Rate Stresses for European Structured Finance Transactions* methodology.

For all of the above, DBRS Morningstar assesses any mitigants proposed by the issuer or their agents; however, DBRS Morningstar evaluates on a case-by-case basis whether (1) the proposal is sufficient to hedge the rated liabilities and (2) the degree to which the counterparty is in compliance with the relevant DBRS Morningstar criteria as outlined in the appropriate derivative and legal criteria.

### **Liquidity**

Liquidity risk may arise because of differences in the frequency of payments due on the liabilities versus the frequencies of collections on the portfolio of assets. In certain transactions, an event of default could occur if the proceeds available at a payment date are insufficient to cover senior expenses and interests due on the notes. Liquidity risk is not directly related to the performance of a portfolio and may occur even if the portfolio of assets is performing well.

Most transactions provide mechanisms to mitigate liquidity risk, the most common of which is a cash reserve account or reserve fund that is available to cover temporary shortfalls in collections. Other structural features could be included in the priority of payment structure, such as access to principal proceeds to pay interest due on the notes and deferral or trapping triggers also help to reduce liquidity risk.

For each transaction, DBRS Morningstar generates a cash-flow tool that simulates the expected flow of funds of the transaction to test the soundness of the proposed structure under different scenarios and stress levels. The tool captures the impact of any liquidity risk caused by mismatches in payment frequency between assets and liabilities, while also considering the priority of payments proposed and the existence of any triggers or tests that change the normal sequence of payments.

### **Positive or Negative Selection**

As described in the section Probability of Default – Historical Performance, the PD assumption used in the DBRS Morningstar analysis is derived from the historical performance data and information of the originator's loan book. There can be instances where the portfolio being securitised has an overall risk profile that differs from the risk profile of the loan book. For example, an originator might have selected only loans that have better credit quality, as measured by the originator's internal rating, by excluding loans from worst-rated categories. Similarly, the originator could have selected a portfolio with an objective to reduce or manage the loan book exposure to particular industries or regions that have higher default expectations.

DBRS Morningstar determines if the historical performance information on which the PD is based is representative of the risk in the proposed portfolio. The historical performance can only be relied upon if the portfolio's risk attributes are similar to the total loan book from which the historical performance data is derived. The main risk attributes include, but are not limited to, characteristics such as industry and region distribution, borrower type, internal rating distribution and collateral type.

In cases when DBRS Morningstar believes that the portfolio's selection is biased, it may make adjustments to the PD assumption to check that it better reflects the risk of the portfolio.

### **Permitted Variations**

Most transactions allow the originators some flexibility regarding renegotiation of specific conditions of the loans post-sale or transfer to the transaction. Permitted variations are generally limited to changes in the interest rate and maturity profile of the loans. Changes to the interest rate of the loans can affect the amount of interest being collected from the assets or expose the transaction to basis risk, while variations of the loan maturity alter the risk horizon of the portfolio.

The extent of these permitted variations differs by transaction, originator and jurisdiction; however, the more flexibility the transaction allows, the more those variations can have an impact on the transaction performance. DBRS Morningstar may consider that all or some of those permitted variations occur once the transaction becomes effective and tests the transaction's ability to withstand these variations.

### **Delinquent Loans**

It is not unusual for transactions to allow a small bucket (typically up to 5% of total portfolio balance) of delinquent loans to be included in the portfolio selected at closing. Transaction documentation should clearly state if loans in arrears are eligible to purchase, and if so, provide limits regarding the severity of the delinquency (i.e. number of dpd) as well as percentage of total portfolio that can consist of delinquent loans.

DBRS Morningstar will typically not penalize for transactions with small buckets of loans up to 30 dpd. For loans with between 30 dpd and 60 dpd DBRS Morningstar may assume a default rate of between 50% and 100%. Lastly, loans with more than 60 dpd are normally assumed to be defaulted.

### **Replenishing or Managed Transactions**

Replenishing or managed transactions are common in SME CLOs in some European jurisdictions. These structures allow the originator the ability to sell new loans to the transaction using the principal proceeds from amortised assets in the portfolio. The replenishing period typically ranges from two to five years from the closing date, although it can be shortened if some performance-related metrics are breached.

Replenishing transactions can be valuable for the originator, as they provide a recurring funding option for a certain period of time; however, they also introduce new risks to the transaction by extending the risk horizon of the portfolio and potentially allowing for some portfolio deterioration. Portfolio replenishment should follow certain criteria established in the transaction. Replenishment criteria generally specify minimum and maximum levels for specific characteristics to be observed at the loan level or at the portfolio level before replenishment is authorised.

Typical replenishment covenants include, but are not limited to, the following: minimum interest rate or floating spread, maximum WAL, maximum percentage within a specific industry or region, maximum obligor exposure, minimum proportion of loans secured by mortgages and WA bank internal rating.

DBRS bases its analysis assuming the most risky portfolio allowed by replenishment criteria. This tests for a negative impact from replenishments into riskier assets or assets with lower recovery prospects, as allowed by replenishment guidelines.

### **Data Request for Rating SME CLOs**

To conduct its analysis, certain key data are typically provided to DBRS Morningstar for the initial rating and the ongoing transaction surveillance, including loan-level data at closing and on a regular basis thereafter to allow for timely surveillance. In addition to transaction-specific data, DBRS Morningstar also requests default data relating to the originator's performance and may request data and information about the originator's internal scoring system to the extent that DBRS Morningstar uses these systems as an input for analysis.

- DBRS Morningstar requests the following information to analyse the prior performance of the originator's SME loan portfolio:
  - Default and payment data on a periodic basis, preferably on a quarterly basis. Defaults are expected to be recognised when the relevant loan is 90-plus dpd, unless DBRS Morningstar has made a determination for an entire country that a different standard is used.
  - Default data should include the number of loans made per period and then track the number of loans that default from each cohort in a given period. To avoid double counting, a loan should only appear as a defaulted asset in the period during which a default first occurs.
  - In addition to looking at the number of loans and the number of defaults, DBRS Morningstar requests the equivalent default data based on the par amounts of the loans (i.e., the principal balance of loans made in the reference period and the notional of loans defaulted over time going forward for each cohort).
  - As of the date of this methodology, defaults for Italy are regarded as being 180-plus dpd.
- Recovery data over time. As with default data, DBRS Morningstar requests the defaults that occur on a quarterly basis and the recoveries that these defaults realise over time.
- Default and recovery data should be broken down into the same categories that the loan data would be presented for the proposed transaction. For example, if the originator divides its customers into micro, small and medium-sized borrowers, the data provided should also be broken up into these categories.
- Delinquency data by origination cohort for loans 30 to 60 dpd, 60 to 90 dpd, 90 to 180 dpd and 180 to 360 dpd.
- Data should cover a period of up to ten years and the latest data should be no more than six months prior to the date of delivery of the file.

A template for the originator performance and portfolio information is available from DBRS Morningstar upon request.

Alternatively, DBRS Morningstar may conduct a mapping exercise, in which case the information request is detailed in the *Mapping Financial Institution Internal Ratings to DBRS Morningstar Ratings for Global Structured Credit Transactions* methodology.

## Surveillance

The purpose of this section is to set forth the surveillance methodology and process DBRS Morningstar uses for SME CLOs. This section is applied in conjunction with the General Structured Finance Surveillance Methodology section of the *Master European Structured Finance Surveillance* methodology. Included below is a discussion of the analysis process and the key credit factors that DBRS Morningstar examines.

### Performance Metrics

While reporting requirements and data availability may vary between issuers and jurisdictions, DBRS Morningstar monitors the following performance metrics to develop a more comprehensive picture of a transaction's performance. The listing below includes many of the metrics reviewed, although additional factors may be considered.

#### *Default & Loss Rates*

One of the key performance vectors evaluated is that for expected lifetime pool defaults. Expected defaults are measured against available credit enhancement to determine if the transaction is still within acceptable bounds for its current rating. Net losses are a function of default frequency and severity upon disposition of the asset. Actual defaults and losses are tracked.

#### *Delinquencies*

Delinquent loans are a signal of potential future defaults and losses. Developing trends in delinquencies are tracked and compared with default expectations. Persistently delinquent assets are considered in the default and loss analysis.

#### *Credit Enhancement/Excess Spread*

Credit enhancement may come in the form of subordination, overcollateralisation, reserve accounts and excess spread (or a combination of these). Credit enhancement is monitored both in terms of the level required by transaction documentation and its sufficiency to cover losses projected by DBRS Morningstar.

#### *Ratings and Financial Condition of Key Entities*

DBRS Morningstar incorporates a financial review of relevant parties in its periodic evaluation of a transaction. This entails a review of the company's financial condition in relation to rating thresholds or triggers. DBRS Morningstar monitors the exposure to hedging counterparties in accordance with the *Derivative Criteria for European Structured Finance Transactions* methodology. DBRS Morningstar also monitors the credit quality of any account banks to mitigate risks from the potential failure of an institution holding funds, especially in cases of reserve fund accounts that act as credit enhancement.

#### *Pool Composition*

SME CLO pools can be either static or revolving. In either case, pool composition is monitored based on changes to borrower concentration, industry concentration, regional concentrations, WA spread, WAL, asset type, loan security type and other concentrations. For revolving deals, DBRS Morningstar generally models to the worst-case pool.



*Triggers*

Transactions may have triggers relating to pool performance or changes in ratings for transaction participants. Breaches of triggers may necessitate changes such as increases in credit enhancement or replacement of transaction parties. These triggers are typically tied to pool loss and delinquency rates but can also be tied to certain concentration limits. DBRS Morningstar tracks compliance with these triggers in each of its periodic reviews and may recalculate certain performance metrics to assist in the evaluation.

## Appendix A: Tables Relating to Analysis of SME Securitisations

**Table 1** DBRS Morningstar Industry Codes

DBRS Morningstar Industry	DBRS Morningstar Industry Code
Aerospace & defence	1
Air transport	2
Automotive	3
Beverage & tobacco	4
Radio & television	5
Brokers, dealers & investment houses	6
Building & development	7
Business equipment & services	8
Cable & satellite television	9
Chemicals & plastics	10
Clothing/textiles	11
Conglomerates	12
Containers & glass products	13
Cosmetics/toiletries	14
Drugs	15
Ecological services & equipment	16
Electronics/electrical	17
Equipment leasing	18
Farming/agriculture	19
Financial intermediaries	20
Food/drug retailers	21
Food products	22
Food service	23
Forest products	24
Health care	25
Home furnishings	26
Lodging & casinos	27
Industrial equipment	28
Insurance	29
Leisure goods/activities/movies	30
Nonferrous metals/minerals	31
Oil & gas	32
Publishing	33
Rail industries	34
Retailers (except food & drug)	35
Steel	36
Surface transport	37
Telecommunications	38
Utilities	39
Miscellaneous	40
Sovereign	41

**Table 2** DBRS Morningstar Idealised Default Table (%)

Rating	Tenor (Years) 5									
	1	2	3	4	5	6	7	8	9	10
AAA	0.0110	0.0264	0.0460	0.0699	0.0987	0.1330	0.1736	0.2212	0.2765	0.3405
AA (high)	0.0161	0.0390	0.0691	0.1071	0.1539	0.2107	0.2784	0.3580	0.4501	0.5554
AA	0.0212	0.0517	0.0922	0.1442	0.2091	0.2883	0.3832	0.4948	0.6237	0.7703
AA (low)	0.0281	0.0709	0.1297	0.2055	0.2994	0.4123	0.5445	0.6962	0.8672	1.0571
A (high)	0.0419	0.1095	0.2045	0.3280	0.4801	0.6602	0.8671	1.0991	1.3543	1.6306
A	0.0487	0.1287	0.2419	0.3893	0.5704	0.7841	1.0283	1.3005	1.5978	1.9173
A (low)	0.0945	0.2420	0.4391	0.6815	0.9643	1.2825	1.6309	2.0045	2.3990	2.8101
BBB (high)	0.1860	0.4685	0.8333	1.2659	1.7521	2.2792	2.8359	3.4126	4.0013	4.5956
BBB	0.2318	0.5818	1.0305	1.5581	2.1460	2.7776	3.4384	4.1166	4.8024	5.4884
BBB (low)	0.3732	0.8912	1.5142	2.2099	2.9528	3.7230	4.5053	5.2884	6.0636	6.8252
BB (high)	1.0800	2.4384	3.9327	5.4686	6.9863	8.4500	9.8400	11.1473	12.3697	13.5091
BB	1.3627	3.0573	4.9001	6.7721	8.5997	10.3408	11.9738	13.4908	14.8921	16.1826
BB (low)	2.2346	4.7297	7.2541	9.6836	11.9572	14.0507	15.9604	17.6938	19.2641	20.6863
B (high)	3.6297	7.4056	11.0204	14.3419	17.3292	19.9866	22.3389	24.4186	26.2592	27.8922
B	4.8503	9.7471	14.3160	18.4179	22.0296	25.1805	27.9201	30.3028	32.3799	34.1974
B (low)	10.0776	17.6609	23.5135	28.1371	31.8670	34.9314	37.4891	39.6528	41.5044	43.1047
CCC (high)	18.7898	30.8505	38.8426	44.3357	48.2625	51.1831	53.4376	55.2363	56.7119	57.9502
CCC	22.2746	36.1264	44.9743	50.8151	54.8208	57.6837	59.8169	61.4696	62.7949	63.8884
CCC (low)	61.1373	68.0632	72.4872	75.4076	77.4104	78.8419	79.9085	80.7348	81.3974	81.9442
C	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000

**Table 3** Correlation Assumptions

Liability Rating Class	Inter-Industry Correlation (%)	Intra-Industry Correlation (%)
AAA (sf)	11.375	28.438
AA (sf)	9.750	24.375
A (sf)	8.250	20.625
BBB (sf)	6.625	16.563
BB (sf) and below	5.125	12.813

## Appendix B: DBRS Morningstar Diversity Model

### Model Overview

The Diversity Model aims to produce stressed default rates for use in a cash flow tool that tests ability of specific tranches or notes to withstand each rating level stress assumptions. A Monte Carlo simulation of the default of each loan is performed in each trial, with the result stored in a loss distribution. A rating-based stress is produced using the DBRS Morningstar idealised default table (IDT); the percentile of the loss distribution that corresponds with the IDT at a given rating level is the output of the model.

### Correlation

Correlation assumptions are in Table 3 of Appendix A. For each set of correlations, the model uses a factor-based simulation to produce correlated random numbers, where  $\rho$  is a macro correlation factor,  $\rho_{si}$  is a correlation factor for each industry/sector,  $F$  and  $F_{si}$  are random factors and  $\epsilon_i$  is an idiosyncratic random variable:

$$PD_i = \sqrt{\rho} F + \sqrt{\rho_{s_i} - \rho} F_{s_i} + \sqrt{1 - \rho_{s_i}} \epsilon_i$$

### Default Rates

A pool-wide or asset-level annual default rate is used for each asset. This annual default rate is extrapolated based on a hazard rate to generate a PD for each future period.

### Amortisation Schedules

As a new feature in the Diversity Model, the amortisation schedule for each individual loan is taken into account. Each loan's PD simulation produces a period of default based on its hazard rate. For each loan that defaults, the model will determine the EAD based on each loan's amortisation schedule. For example, if a loan has a balance of EUR 100 with a pay down of EUR 10 in each year and the loan defaults during Year 5, it will only default EUR 60 of par.

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On 2 July 2019, Morningstar, Inc. completed its acquisition of DBRS. Combining DBRS' strong market presence in Canada, the U.S., and Europe with Morningstar Credit Ratings' U.S. footprint has expanded global asset class coverage and provided investors with an enhanced platform featuring thought leadership, analysis, and research. DBRS and Morningstar Credit Ratings are committed to empowering investor success, serving the market through leading-edge technology and raising the bar for the industry.

Together as DBRS Morningstar, we are the world's fourth-largest credit ratings agency and a market leader in Canada, the U.S., and Europe in multiple asset classes. We rate more than 2,600 issuers and 54,000 securities worldwide and are driven to bring more clarity, diversity, and responsiveness to the ratings process. Our approach and size provide the agility to respond to customers' needs, while being large enough to provide the necessary expertise and resources.



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