# Non-Performing Loan ABS Rating Methodology

Structured Finance

5 August 2022


**Contacts**

**Antonio Casado**
Executive Director
+49-30-27-891-228
a.casado@scoperatings.com

**Paula Lichtensztein**
Senior Representative
+49-30-27-891-224
p.lichtensztein@scoperatings.com

**David Bergman**
Managing Director
+39-02-30-315-838
d.bergman@scoperatings.com

**Rossella Ghidoni**
Director
+39-02-94-785-746
r.ghidoni@scoperatings.com

## Table of Contents

# 1. Executive summary

## 1.1 Introduction

Structured finance securitisations of non-performing loan (NPL) portfolios are exposed to irregular payment flows. The special servicer's ability is key to extract value through arrears management, legal enforcement, out-of-court negotiations, and/or the disposal of repossessed properties. In addition, secured portfolios – typically backed by real estate collateral – are critically exposed to collateral appraisal quality, asset liquidity risk and market price fluctuations. The speed of recoveries is as crucial as the recovery amounts because NPL securitisation structures typically do not generate income, resulting in a high exposure to negative cost of carry. To derive recovery amount and timing expectations, our analysis focuses on: i) a risk analysis of the portfolio and collateral value; ii) the applicable legal framework and enforcement proceedings; and iii) the special servicer's capabilities.

## 1.2 Ratings and applicability

This document describes our methodology for rating securitisations of secured and unsecured non-performing receivables[1].

We consider the following receivables to be non-performing: i) loans classified as defaulted; ii) impaired loans as defined by the applicable accounting framework; iii) loans not classified as defaulted but for which full repayment seems unlikely (e.g. unlikely-to-pay exposures); and iv) most/certain re-performing debt exposures.

We follow a bottom-up analytical approach designed to capture the specificity of each transaction and to reflect local characteristics. Transaction-specific assumptions may differ from those of peer transactions and other market benchmarks for reasons ranging from the portfolio's quality to the servicer's capabilities and the soundness of property appraisals. Appendix I provides a workout example for an Italian NPL ABS.

This methodology complements and should be read together with our General Structured Finance Rating Methodology and Counterparty Risk Methodology, both available at www.scoperatings.com. This methodology may also apply to securitisations backed by portfolios of real estate-owned assets (REOs) with similar analytical features such as a large exposure to collateral value risk, uncertainties regarding asset disposals, or a reliance on a highly specialised servicer. The methodology applies to European securitisations but may be applied selectively to non-European transactions where appropriate.

## 1.3 Methodology highlights

Our approach to rating NPL transactions considers the following elements in particular:

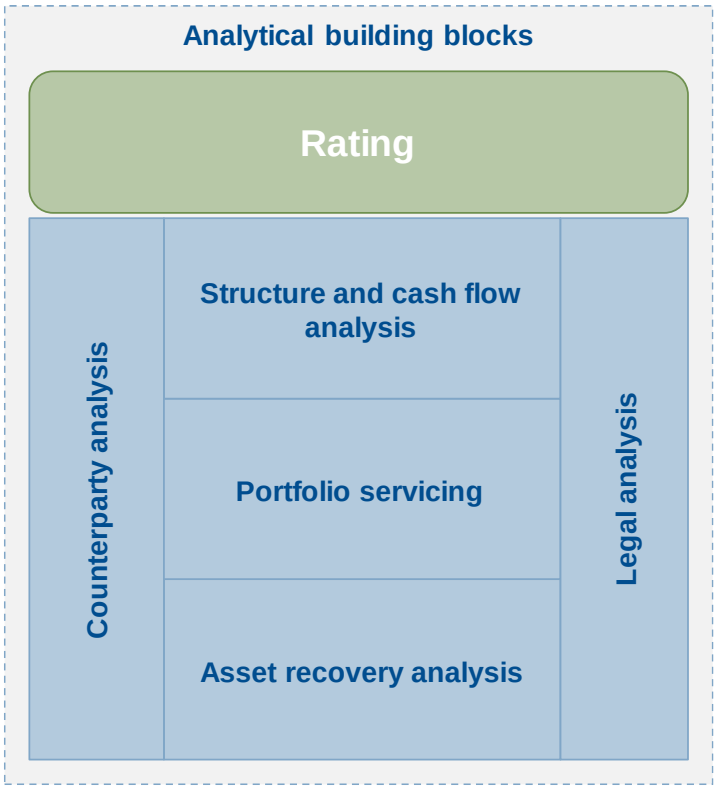
- **Independent portfolio analysis.** We follow a bottom-up approach to derive transaction-specific performance assumptions. This involves an analysis of loan and borrower attributes, the type of security, the security appraisal value, and applicable recovery and repossession procedures. The approach enables us to develop an independent view on the relevant risks and to factor in further insights from the servicer's business plan, peer comparisons and market data.
- **Servicer incentives, capacity and track record.** We evaluate the servicer's quality, business plan, and incentives to extract value from the portfolio. An example is the ability of the performance fee structure to align incentives between the servicer and the noteholders.
- **Jurisdiction specifics.** Our analysis reflects local practices and patterns, particularly the specificities of European legal frameworks and real estate markets.
- **Distinct analysis for secured versus unsecured.** We have two distinct approaches depending on whether a loan is secured or unsecured. For unsecured loans, our recovery analysis accounts for loan ageing. The analysis of secured loans considers the benefits of real estate security and other sources of available security.
- **Servicer recovery strategy.** We compare our expectations against those of the servicer's business plan and might incorporate in our analysis the servicer's assumptions. This is subject to the receipt of adequate information regarding the efficiency of the servicer's recovery strategy and operational process, as explained in the context of the operational review. For example, we might integrate into our analysis specific workout plans for concentrated positions. Additionally, we might consider repayment plan projections and the seizure of a borrower's salary or pension as part of a servicer's strategy.
- **Recovery cash flow projections.** We analyse the transaction's liability structure and test the different recovery rates and timing assumptions. Our cash flow projections use deterministic rating-conditional stresses, which we may supplement with stochastic cash flow projections when permitted by data.
- **Counterparty risk.** We evaluate the role and strength of transaction counterparties as well as potential risks associated with the misperformance of a key counterparty.

[1] Underlying exposures are typically mortgage loans, bank accounts, consumer loans and lease receivables. Throughout this document, for simplicity, we will refer to them as non-performing loans.

## 2. Analytical framework

The analytical framework covers the aforementioned elements in five key areas: i) asset recovery analysis; ii) portfolio servicing; iii) structure and cash flow analysis; iv) counterparty analysis; and v) legal analysis. A joint analysis of the portfolio's characteristics and the servicer's capabilities allows us to estimate portfolio cash flows. These cash flow projections from the assets are allocated based on the transaction's structure. The main inputs of our cash flow projections are the priorities of payments, note size, expected coupons, transaction fees and expenses, reserves for liquidity or credit risk, transaction triggers and, in some instances, a quantification of certain counterparty risks.

**Figure 1: Analytical building blocks**




The analysis uses both qualitative and quantitative inputs, considering data quality and the rating's sensitivity to key analytical assumptions. The analytical outcome may depart from a strict quantitative analysis because it reflects qualitative and fundamental credit views on risks (e.g. the servicer's incentives, or the quality and soundness of its business plan) that are crucial to the assessment but are difficult to capture in a purely quantitative analysis.

### 2.1 Asset recovery analysis

We classify non-performing loans guaranteed by a security as secured and the remaining as unsecured. This section describes our analytical approach to estimating two key drivers of a portfolio's cash flow: recovery amount and recovery timing. We derive specific recovery assumptions for both secured and unsecured portfolio segments. The analysis is subsequently complemented by our assessment of the servicer's capabilities and recovery strategy.

We derive the expected recovery amount and timing based on: i) our assessment of portfolio quality; ii) our forward-looking view on the economic environment and the performance of the legal system; and iii) in the case of secured loans, collateral valuations, marketability risks and the evolution of property prices. We benchmark our expectations against those in the servicer's business plan, when available, and may integrate some components into our analysis, such as specific workout plans for concentrated positions.

We assess the portfolio's quality based on its composition, benchmarking against peer transactions to pinpoint unique performance drivers such as the quality and amount of collateral, or the ageing of defaulted exposures.

Our analytical frameworks to derive recovery assumptions differ depending on whether the exposures are secured or unsecured. For secured loans, recovery amounts are mainly based on the analysis of collateral values; recovery timing assumptions are derived by considering the type of legal proceeding and the stage of recovery as of the cut-off date. Recovery rate assumptions for unsecured loans are based on the analysis of historical performance information.

### 2.1.1 Portfolio attributes

The quality of the portfolio is mainly driven by the following loan, borrower and collateral attributes:

- **Loan collateralisation**. Recovery rates from secured loans backed by a first-lien security are generally higher than from second-lien or unsecured loans. If data is available on first-lien loans outside the collateral pool, we may give credit to the collateral of second-lien exposures. Otherwise, we consider second-lien loans as unsecured.
- **Readily marketable collateral.** We may consider whether the security is repossessed, regularised or to be sold in the open market, based on the jurisdiction and type of receivable. Our recovery timing assumptions are generally calibrated based on proprietary and market data, and if available, on the servicer's historical time-to-sell data.
- **Loan-to-value distribution.** All else being equal (e.g. for two portfolios with equivalent loan-to-value ratios on an aggregate basis), the benefit of collateral is reduced if its value is skewed towards low loan exposures. This is because, on a loan-by-loan basis, recovery proceeds are capped by the minimum of the loan's gross book value and the mortgage value.
- **Debtor status.** Our analysis distinguishes between bankrupt and non-bankrupt borrowers. Foreclosures in the context of bankruptcies tend to be more complex and lengthier. Bankruptcy proceedings result in lower expected recovery rates for unsecured exposures, as these focus on liquidating assets rather than maintaining a borrower as a going concern.
- **Debtor characteristics.** Our analysis considers relevant debtors' characteristics (e.g., age, employment and retirement status, internal or external credit scorings, financial data of the debtor, employer type and legal status).
- **Ageing**. Recoveries from aged, unsecured defaulted loans are generally lower than for recently defaulted loans, as recoveries are typically concentrated in the first years after a default, particularly for corporates. If applicable, our recovery rate assumptions may be based on the date on which a specific recovery strategy was initiated rather than on the default date (e.g., when a borrower's salary is seized).
- **Syndications.** Recoveries from syndicated loans are distributed pro-rata among the syndicated creditors, making it important to know the issuer's share in the syndication to adjust the expected recovery accordingly.
- **Concentrated positions.** Portfolios with high borrower and collateral concentrations expose noteholders to idiosyncratic risk. To assess this risk, we may examine appraisal reports backing the top exposures, either on a line-by-line basis or using a sample and review the servicer's business plan[2]. Depending on the collateral's concentration and quality, we may apply rating-conditional recovery haircuts, or stressed volatility parameters if expected recovery rates are modelled using a probability distribution.

### 2.1.2 Expected recovery amounts

#### 2.1.2.1 Secured exposures: collateral value analysis

We typically estimate the recovery rates of secured NPL portfolios by applying our framework for fundamental recovery analysis, described in our General Structured Finance Methodology. Under this framework, we estimate the security's current value based on property appraisals and then apply deterministic (rating-conditional) security-value haircuts to capture forward-looking market value and liquidity risks. Security-value haircuts are calibrated based on proprietary data, the servicer's historical repossession data and public market data. We analyse the positions on a line-by-line basis.

If the data is available, we will complement this approach with a statistical analysis of either the servicer's recovery vintage data or alternative data on historical recovery rates for assets like those analysed.

Security-value haircuts on leased properties and REOs are generally lower than those applied for mortgaged properties expected to be sold at judicial auctions. Leased assets and REOs are sold in the open market, benefitting from a wider range of potential buyers and the possibility to increase the property value and marketability through capital expenditure.

[2] In some cases, concentrated positions can be a positive feature if loan collateral is of above-average quality and the servicer is able to focus recovery efforts and resources on these positions, achieving a more efficient workout process.

We give credit to real-estate security as well as other forms such as pledges on cash accounts and real or financial assets, provided that the security's enforceability cannot be legally contested and that market value and liquidity risks can be reasonably estimated.

The building blocks of our fundamental recovery analysis on secured mortgage loans are detailed below.

**Property appraisal analysis**

We assess the quality of a property appraisal by considering: i) the transparency of the appraisal process; ii) the quality of the valuation techniques applied; iii) the age of the appraisals; and iv) the appraiser's incentive to conduct unbiased valuations.

Our estimates of current property values generally rely on the latest appraisals from independent third parties. However, property appraisals connected with secured NPL securitisations are often unreliable due to: i) outdated valuations; ii) simplified valuation procedures (e.g., desktop or statistical valuations); iii) properties still being under construction; iv) lack of information on the appraisal methodology; or v) valuation bias arising from an appraiser's lack of independence from transaction parties, for instance, an appraiser appointed by the originator or portfolio seller may conduct more optimistic valuations.

We capture any limitations on appraisal quality through transaction-specific haircuts (see an example in Figure 4 in Appendix I). In addition, we update seasoned valuations through indexation techniques based on public or private real estate indices.

**Market value risk**

Our fundamental approach to deriving property price assumptions for NPL ABS follows the principles outlined in the General Structured Finance Methodology and involves three steps. First, we estimate a long-term sustainable growth rate (SGR) for nominal property prices. The SGR may incorporate, among others, metrics related to property affordability, property profitability, private-sector indebtedness, population dynamics, long-term macroeconomic performance and long-term house prices. We use the SGR to deflate nominal prices and calculate the average SGR-deflated historical price. Lastly, we analyse the historical variability of the SGR-deflated price time-series to derive rating-conditional market-value-decline assumptions.

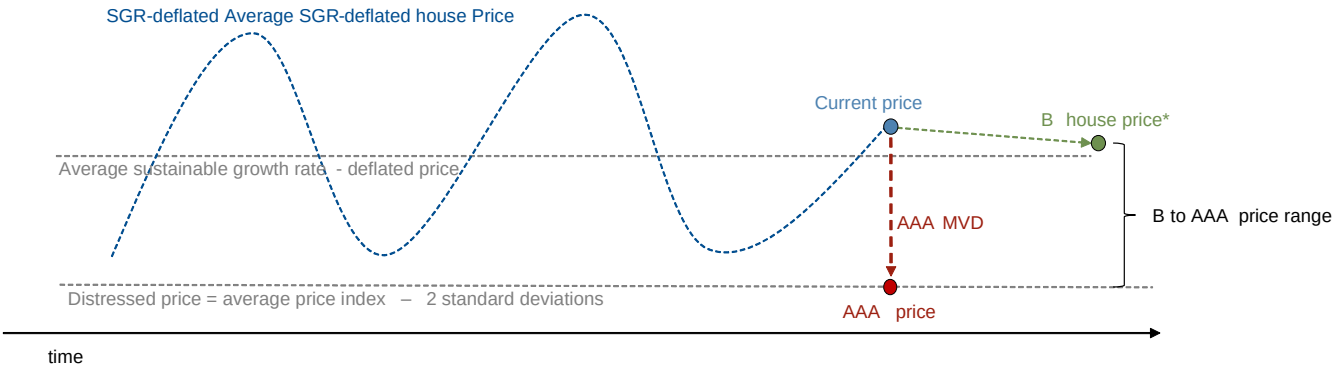
The B market-value decline generally considers the distance between the current and the historical average SGR-deflated prices, reflecting our baseline scenario based on current market conditions. The B market-value decline may not necessarily reflect the full distance between the current price and the historical average; we could even take a negative value if we expect house prices to increase over the transaction's life.

The AAA market-value decline typically captures the distance between the current and the historical average SGR-deflated prices plus a stress to capture historical price variability. This stress may also capture collateral negative selection, for instance, in case of very seasoned NPL portfolios. We may apply a market-value-decline cap or floor to address data limitations, such as non-stationary or too short historical time series.

We generally derive market-value-decline assumptions for intermediate rating categories by using an interpolation of B and AAA market-value-decline assumptions.

We may supplement the market value risk analysis with a stochastic approach to analyse market value and liquidity risks if permitted by available data.

**Figure 2: Example of market-value risk analysis**




* In this example, we assume property prices will not fully revert to average prices because market conditions over the transaction's risk horizon are expected to be supportive of nominal real estate prices (for instance, due to expansive credit conditions or positive market sentiment).

Source: Scope Ratings

We use a bottom-up analytical approach to capture portfolio-specific collateral characteristics. For instance, property affordability and profitability metrics may be analysed at the regional level.

Our analysis of market-value risk may be disaggregated by collateral type or property location. For instance, regions with a diversified economy, such as a wider metropolitan area, may be more resilient than rural areas or regions with single-industry concentrations. On the other hand, prices are often more volatile in urban areas as well as for second homes, holiday homes and non-residential properties. We may analyse in more detail a specific type of collateral (e.g. industrial, retail, office, land) or a specific geographical location, in case of high portfolio concentrations.

**Liquidity risk**

Asset liquidity is a key driver of NPL securitisations' expected performance, as collateral is typically subject to severe marketability constraints. This can be driven by below-average asset quality, information asymmetries or obsolescence risk and is captured through transaction-specific fire-sale discount assumptions.

Information asymmetries may occur because potential buyers generally lack access to reliable, granular, readily available standardised information on asset quality and loan tapes. Therefore, potential buyers may offer a price that does not reflect the value of the portfolios for sale, thus hindering potential transactions. Obsolescence risk is high for seasoned assets left unmaintained on the seller's balance sheet and may even be exacerbated by a lengthy enforcement process. Industrial plants or warehouses are more likely to deteriorate and lose value over time, increasing their liquidity risk.

Our fire-sale discount assumptions are benchmarked against jurisdiction-specific historical evidence of market liquidity and may capture qualitative adjustments reflecting the nature of the collateral (e.g. residential versus non-residential). Such assumptions will be adjusted on a deal-by-deal basis to account for: i) servicer-specific historical evidence of appraisal values relative to sale prices; or ii) transaction-specific obsolescence risk, driven by the ageing of the collateral and the workout options available to the servicer.

#### 2.1.2.2 Unsecured exposures: historical recovery data analysis

The main factor influencing the performance of unsecured recovery rates is loan ageing since the date of default. Typically, the higher the ageing of the loan, the lower the expected recovery. This is because other creditors are likely to have already attached available assets from the debtor. The ability to track down a debtor also decreases over time. On the other hand, if the borrower is an individual, the additional time might have a positive impact if, for instance, it provides the opportunity to find new employment.

For unsecured loans, we ideally analyse historical collections from the servicer to derive transaction-specific recovery rate assumptions. This analysis is based either on the line-by-line recovery proceeds or aggregated vintage data provided by the servicer, with recovery proceeds shown for each cohort. We consider the time since the borrowers were classified as defaulted and the portfolio's acquisition date, which sometimes reflects when the recovery strategy was initiated. Sample data should be representative of the securitised portfolio and cover a full credit cycle. We have a positive view of vintage data that is highly

disaggregated, for instance, by borrower type (e.g. corporate or individual), the type of guarantee other than mortgages (e.g. pledges by third parties), and the type of legal proceeding (e.g. bankruptcy or foreclosure).

We apply a deterministic approach to derive recovery rate assumptions. When information is sufficient, we may supplement this analysis using a distribution of recoveries, fitted to reflect the historical recovery patterns of the underlying portfolio segments, e.g. we may also use other types of stochastic analysis to predict cash flows (e.g. regression analysis).

If historical performance data is adequate, we may calibrate recovery rate assumptions by recovery strategy. The most common recovery strategies are:

- **Judicial strategy**. This strategy usually has binary outcomes, resulting in either no recovery or full recovery. Therefore, it leads to relatively fat-tailed portfolio recovery rate distributions. Smaller loans typically have higher recoveries. Recoveries are usually received as a lump sum. See Appendix II for an example of a stochastic approach to analysing unsecured recoveries.
- **Discounted payoff.** It consists in an extra-judicial agreement with the borrower. The position is closed after the repayment of an amount that is typically lower than the total outstanding debt.
- **Voluntary repayment plans**. They are extra-judicial strategies, under which a borrower agrees a debt repayment schedule. Promissory notes may be used to guarantee the payments.
- **Seizure of a debtor's salary or pension.** Following a court order, a portion of the salary or pension is deducted from the borrower's payslip or pension and paid to the creditor. This ensures regular cash flows unless certain events occur (e.g. unemployment or life events). Depending on the debt amount and the borrower's income or pension level, the time to recovery may be longer than under other judicial or discounted payoff strategies.

#### 2.1.2.3 Residual claims after security enforcement

In certain jurisdictions, a secured creditor may initiate enforcement actions against a debtor after the closure of an enforcement action concerning the security. Secured creditors generally rank equally with unsecured creditors for amounts that have not been satisfied with the enforcement of the security. The creditor's right to recover its claim, whether secured or unsecured, arises with an enforceable title (e.g., a judgment, or an agreement signed before a public notary).

We may give credit to potential further recoveries on residual claims after the security is enforced. This is particularly the case for individual borrowers (as opposed to corporates) because, as mentioned above, the elapsed time after a default might have a positive impact.

### 2.1.3 Recovery timing assumptions

The recovery timing of each loan depends largely on the stage of legal proceedings, the repossession status (in case of REOs or leased properties), the servicer's skills in managing the portfolio and the legal enforcement framework.

Lengthy, volatile or unpredictable enforcement frameworks erode the present value of expected recovery proceeds. This is due to the interplay of various factors: i) the time value of money; ii) the build-up of procedural and legal expenses; and iii) an increase in investors' required rate of return.

Lengthy enforcement procedures also increase collateral obsolescence risk, particularly for secured portfolios backed by highly illiquid assets such as industrial plants or warehouses. Such assets generally deteriorate and lose value during a long enforcement procedure due to a loss of the location's strategic value, the technological obsolescence of facilities or the deterioration of a property due to poor maintenance.

#### 2.1.3.1 Secured loans

We apply a line-by-line approach to derive recovery timing assumptions for each secured exposure. For each loan, we estimate the remaining time to recovery based on the stage of the recovery procedure in the context of the relevant enforcement framework, which determines the procedure's expected total duration. We capture potential volatility through rating-conditional stresses. When information is sufficient, we may supplement this analysis using a recovery timing distribution. In the absence of line-by-line data, we may apply generic recovery timing assumptions.

We analyse the expected timing of recovery procedures by considering the official/market statistics of corresponding jurisdictions, the servicer's documented experience, and recent or prospective legal developments. An example is an initiative to reduce the

timing and costs of enforcement and improve court capacity and legal certainty. When relevant, we may also differentiate by region, court and type of legal proceeding (e.g. bankruptcy or insolvency).

This analysis may be complemented with the servicer's experience data and out-of-court workout plans. We also analyse workout timing assumptions from the servicer's business plan and determine whether to deviate from average assumptions, which is especially relevant for large exposures with detailed information on positions and recovery strategy.

#### 2.1.3.2 Real estate-owned assets (REOs) and leased properties

For leasing receivables or REOs, we estimate the remaining time to recovery based on several factors. These include i) the repossession stage of the asset and marketability of such an asset; ii) the servicer's ability to set the asset-specific strategy to preserve its value through adequate property management practices to then remarket and sell the asset; iii) the open market liquidity on the geographical area where the asset is located; iv) the asset type (e.g., residential, industrial, commercial); and v) the type of legal proceeding and court (if applicable) in relation to the repossession process.

#### 2.1.3.3 Unsecured exposures

For granular unsecured portfolios, we generally base our timing assumptions on the analysis of historical cohorts, which show recovery amounts in each period since the date of default. We conduct a scenario analysis to test the sensitivity of the ratings to a lag in recovery timing. We may also apply deterministic stresses to extend the weighted average life of expected collections if this is material for the analysis, for example, for portfolios heavily exposed to unsecured recoveries.

#### 2.1.3.4 Unlikely-to-pay exposures

Unlike defaulted loans, unlikely-to-pay exposures may be performing or will return to performing after restructuring. Consequently, we may assume higher or faster recoveries for these loans than for those classified as defaulted. On the other hand, if these loans eventually default, the overall recovery timing is likely to be longer as the recovery process can only start once loans are declared defaulted. Transition matrices might be used to estimate the loans' migration into a default or re-performing status.

#### 2.1.3.5 Re-performing exposures

Re-performing loans are exposures that have been in arrears or default and that are currently paying regularly. Re-performing loans may have been restructured. For re-performing exposures we generally base our timing assumptions on historical data, considering information on payment and restructuring plan schedules.

## 2.2 Portfolio servicing

The servicer's ability to extract value by managing enforcement proceedings or out-of-court negotiations is crucial for NPL securitisations, because impaired and defaulted loans need active management to extract cash flow. This part of the analysis complements the portfolio analysis and may lead us to qualitatively adjust our calculations of recovery amounts and timing.

NPL portfolio servicing can be conducted in-house by the loan originator and/or seller or outsourced to specialised servicers. A critical part of our analysis involves an assessment of the servicer's capabilities, its alignment of interests with noteholders, and the viability of its portfolio workout plan.

Securitised NPL portfolios are typically managed by specialised servicers, as this is often more efficient than setting up specialised in-house departments and infrastructure. A deep and well-functioning market of special servicers may also improve recovery prospects because it contributes to market liquidity and procedural efficiency.

### 2.2.1 Servicer's capabilities

We evaluate the servicer's local expertise, management team and staff, systems and track record.

Analysts assess the servicer's capacity to extract value from an asset, which is highly dependent on local expertise. For instance, servicers may play a critical role in enhancing property values by: i) using local agency networks; ii) proposing value-enhancing strategies such as amending a property's original use; or iii) finding potential purchasers or local entrepreneurs.

The servicer's experience and ability to efficiently manage legal proceedings, actively monitor each phase, and close out-of-court settlements, when appropriate, directly impact the performance of an NPL transaction.

Along with management experience and tenure, we assess the adequacy of staff by considering the volume of distressed assets that needs to be handled. We analyse staff incentives to manage the securitised portfolio, staff scalability, and compensation policies.

Another key element of this analysis concerns portfolio management systems and software solutions. Ideally, all aspects of the servicing performed on each loan are electronically recorded and regularly monitored by senior management. We also evaluate the servicer's ability to transfer portfolio information into a new IT system, e.g. in the case of a servicer substitution.

Finally, we assess the servicer's track record. Portfolio assumptions are benchmarked against the servicer's historical performance and may be adjusted. For instance, historical evidence regarding the accuracy of servicer valuations compared to realised property sale prices is critical to determining our valuation assumptions and liquidity haircuts (fire-sale discounts).

#### 2.2.2 Alignment of interests

We assess whether the servicing fee structure is linked to portfolio performance in a way that mitigates conflicts of interest between the servicer and noteholders. This feature incentivises the servicer to maximise recoveries and adhere to the initial business plan. In addition, the presence of an independent third party that monitors the servicer's activities, such as a master servicer or a monitoring agent, mitigates operational risk and moral hazard that could negatively impact noteholders' interests.

### 2.3 Cash flow and structure analysis

#### 2.3.1 Cash-flow analysis

We adapted our unconditional expected loss approach described in the General Structured Finance Rating Methodology to account for the risk factors affecting NPL securitisations, by choosing a conditional expected loss approach where the full multivariate distribution of those different risk factors is summarised into a set of rating-conditional assumptions (see Appendix I for a full example). Our conditional expected loss approach involves an analysis of the transaction's main structural features, such as the notes' priorities of payments, note size, note coupons, hedging, senior costs, liquidity as well as fixed and collections-based servicing fees. This analysis produces an expected loss and expected weighted average life for each note.

#### 2.3.2 Liquidity coverage

Liquidity risk is a primary driver of NPL transactions because of the assets' irregular cash flows and the difficulties involved in replacing a servicer. For example, a servicer replacement requires on-boarding time as the new servicer would have to assess the recovery stage and strategy for each loan before continuing the portfolio's collection activities.

We analyse liquidity available to pay senior fees and interest on non-deferrable classes (e.g. cash reserves or liquidity lines) and to cover temporary shortfalls if collections are delayed.

These structural protection mechanisms are key for high-rated tranches given their sensitivity to uncertainties in recovery timing.

#### 2.3.3 Exposure to interest rate risk

We examine unhedged interest rate exposures to assess the risk of material losses for the rated instrument. NPL portfolios do not contain interest-bearing receivables. Therefore, if transaction liabilities are floating-rate and only partially hedged, a rise in interest rates will increase payment obligations. Some transactions benefit from a cap on a certain notional amount, partially mitigating this risk.

We assess interest rate risk by considering scenarios of increasing interest rates on the notes commensurate with the notes' rating target. If, under a hedging agreement, a swap counterparty pays a different notional from that on the notes, we would test scenarios where, due to the timing of recoveries, the notional amount evolves differently from the notes' amortisation, which would cause some notes to be unhedged.

Fixed-interest-paying notes are more effective at mitigating asset-liability mismatches than floating-rate notes, as the liabilities are not exposed to interest rate movements.

#### 2.3.4 Fees

Under our cash flow analysis, we assume estimated fees are paid to senior transaction parties such as the trustee, the account bank, the corporate servicer, the cash manager, and the servicer. Servicer fees are usually defined as a percentage of the outstanding portfolio and collections, with the fee usually linked to portfolio performance to incentivise the servicer.

#### 2.3.5 Equity leakage

Structures with equity leakage provisions may expose noteholders to additional losses. To protect noteholders, transaction structures may incorporate cash sweep triggers related to certain cumulative collections and profitability ratios. We test the efficiency of such triggers by capturing the different paths of both the collections and the disposals' profitability.

We assess losses for noteholders in the context of expected market conditions as well as the servicer's payment incentives and the alignment of interests with noteholders. For instance, if the front-loaded disposal of the best-quality and most profitable assets resulted in equity leakage in the transaction's early stages, we would analyse the special servicer's independence, or incentives to steer its business plan to the benefit of the equity holders.

### 2.4 Counterparty analysis

We evaluate how risks are linked between the rated instruments and the various transaction parties.

#### 2.4.1 Servicing disruption risk

A jump to default of a transaction's servicer would result in either a loss for investors or a temporary interruption of payments on the notes. Compared with performing portfolios, NPL portfolios are more complex to service and may have smaller markets for suitable servicers depending on the specific jurisdiction.

The length of a servicer replacement process depends, among other factors, on the depth of servicer markets, the ease with which a new servicer can access information on receivables and obligors and the operational complexity of migrating all relevant data to a new platform. Adequate back-up servicer arrangements, such as the appointment at closing of a 'warm'/'hot' back-up servicer or back-up servicer facilitator, can make the servicer transition process smoother and mitigate the risk of missed payments on the notes.

#### 2.4.2 Servicer commingling risk

Some NPL transactions almost eliminate commingling risk by instructing debtors to pay directly into the issuer's account. However, collections could still be received directly by the servicer or originator, depending on the legal process or out-of-court arrangement.

If the potential exposure is significant, our analysis may incorporate any uncovered exposure to the servicer or originator by considering the entity's likelihood of default and the amount of collections at risk. Additional details can be found in the Methodology for Counterparty Risk in Structured Finance.

#### 2.4.3 Set-off risk

Given the nature of non-performing loans, set-off risk for a transaction is generally low and limited to a counter-claim by a debtor that may reduce the receivable's gross value. For further details also refer to the Methodology for Counterparty Risk in Structured Finance.

### 2.5 Legal analysis

In our view, legal risks arise from three main sources: i) the assets and their transfer to the special purpose vehicle (e.g. true sale); ii) the special purpose vehicle issuing the rated debt and its legal structure (e.g. bankruptcy remoteness); and iii) the transaction parties (e.g. enforceability of contractual obligations by the transaction parties). We review legal opinions to gain comfort on our assumptions regarding relevant legal issues.

For NPL transactions specifically, we focus on: i) the validity of claims against defaulted debtors and the quality of receivables documentation; ii) the validity of rights assigned to the issuer over originators' liquidation proceeds; iii) potential liabilities for the issuer arising from counter-claims initiated by debtors; and iv) the robustness of representations and warranties given by the relevant provider[3].

Further details can be found in the General Structured Finance Rating Methodology.

[3] In case the set of representations and warranties is weak and/or it covers only a certain share of the portfolio, we might apply a tailor-made haircut to the expected recoveries.

## 3. Complementary analysis: data quality and monitoring

### 3.1 Data adequacy

Our analysis can be adapted to a wide range of data formats produced by the originator's systems without the need for a template or refactoring after processing.

We leverage on market and macroeconomic data to extrapolate performance references, complemented by a detailed assessment of the servicer's processes and systems.

Our bottom-up approach allows a differential credit view on the originator, the servicer and the portfolio. For this purpose, we assess the adequacy of information received. We may highlight the limits of available data and request additional information when available data is insufficient to analyse a transaction.

### 3.2 Historical performance and portfolio information

We rely on historical information that represents the assets to be securitised. Segment-specific information is relevant when: i) the segments' weights differ to those in the entire historical sample; ii) these weights have materially changed over time; and iii) the characteristics of contract types in the portfolio differ significantly. We also ensure performance references are sufficiently granular to derive statistically significant estimates. Data on the servicer's experience regarding recovery rates and recovery timing is also important, given the servicer's crucial role in an NPL portfolio's performance.

### 3.3 No portfolio data template

We do not use a proprietary template for NPL portfolios and welcome different templates if the information contained is relevant for analysing the assets' risks. Appendix III provides a guideline on the typical line-by-line portfolio information most relevant for NPL securitisations.

### 3.4 Data checks

We may validate information received from originators and other sources, even when these are considered reliable and accurate. Additional information or clarifications may be requested from an issuer or its agents if available information conflicts with our understanding. These checks do not, however, comprehensively verify the reliability and accuracy of the information used for the rating analysis.

NPL pool data is particurlarly complex as it contains details on each position, sometimes even from different sources. We will scrutinise the data and discuss any relevant inconsistencies with the relevant transaction parties. Significant data quality limitations could lead to a qualitative adjustment of assumptions.

Agreed-upon procedures performed by reputable, independent auditors can highlight differences between data supplied to us and the paper- or computer-based data provided by the originator/seller.

We will review the reliability of information by examining the alignment of interests between originators and noteholders, and/or the independence and experience of the parties providing information for the rating analysis. An originator's financial strength also makes effective remedies more probable if representations and warranties are breached.

Conference calls and operational review visits also provide us with more detail on information received. We may request additional information to better understand the processes presented during the operational review visit or to gain more clarity on the assets being securitised.

### 3.5 Rating sensitivity

Our analytical framework for structured finance transactions is designed to result in rating stability for high investment-grade ratings. We achieve this through rating-conditional stresses or adequate levels of volatility around the mean case.

Our rating reports show the stability of ratings with respect to shocks on relevant analytical assumptions. Sensitivity tests reflecting shifts in the expected recovery rate and timing illustrate how much and in which direction ratings depend on quantitative assumptions. Sensitivity test scenarios should not be interpreted as likely or expected scenarios for the transactions.

We typically conduct the following sensitivity tests:

- A decrease in secured and unsecured recovery rates by 10%
- An increase in the recovery lag by one year

### 3.6 Monitoring

We monitor NPL transactions using performance reports such as those produced by the transaction's counterparties (e.g. the servicer, trustee, paying agent and monitoring agent). The ratings are monitored on an ongoing basis and reviewed once a year, or earlier if warranted by events.

# I. Appendix – Rating process: worked example

This section provides an illustrative example of the steps applied to analyse an Italian secured and unsecured NPL portfolio. The assumptions in this example are not prescriptive. They are merely provided to illustrate our deterministic approach[4], under which rating-conditional stresses are applied to B case assumptions (i.e. higher stresses as the instrument's target rating increases). Our bottom-up analytical approach allows transaction-specific differentiation for several factors, such as the quality and type of collateral, the soundness of property appraisals, exposure to specific regions, and the servicer's capabilities.

## Analysis of secured portfolio segment

### Recovery rate assumptions

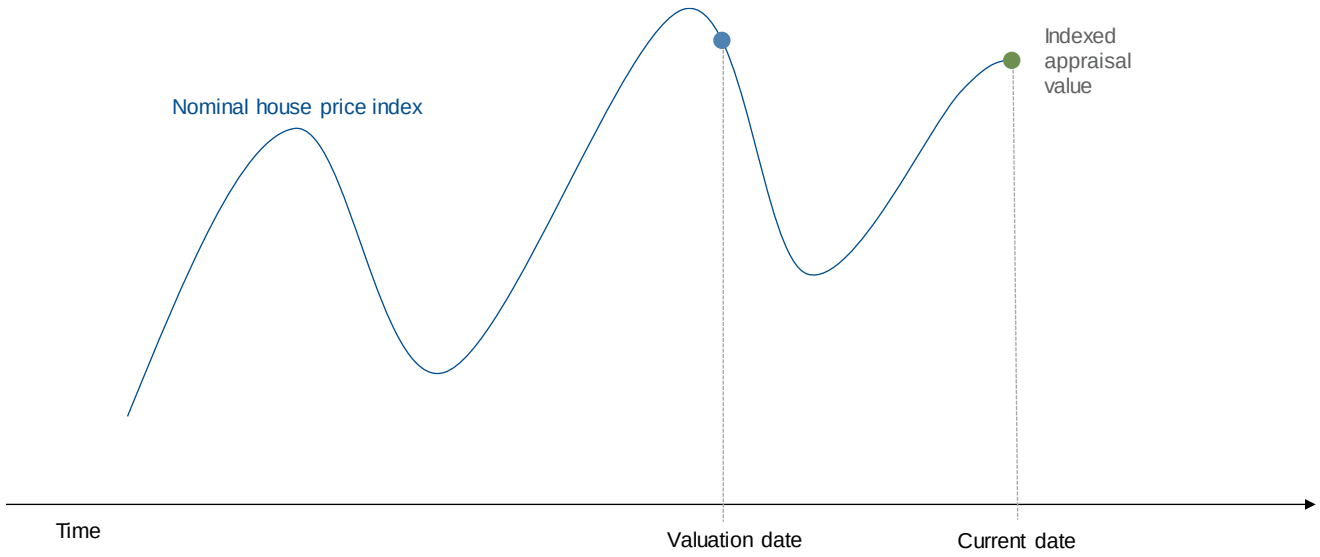
We typically give credit to property appraisals conducted by independent third parties; these form the starting point of our analysis. We apply a series of adjustments and rating-conditional stresses to these appraisal values, to estimate realisable collateral disposal proceeds on a line-by-line basis, which we then aggregate on a portfolio basis.

Realisable collateral disposal proceeds =

initial appraisal value

**x (1 + house price index change between appraisal value date and current date[5])**

**Figure 3: Example of house price index**




Source: Scope Ratings

[4] Given their purely illustrative nature, numerical assumptions shown in this appendix are not updated regularly.
[5] For very outdated valuations, we generally do not give credit to net upward movements of the house price index, to account for high depreciation, write-downs and obsolescence risks.

**x (1 – rating-conditional valuation type haircuts[6])**

**Figure 4: Example of rating-conditional valuation type haircuts**

| Level | Full or drive-by | Statistical or desktop | Other [7] |
|---|---|---|---|
| B | 0% | 4.0% | 8.0% |
| BB | 0% | 4.5% | 9.0% |
| BBB | 0% | 5.0% | 10.0% |
| A | 0% | 5.5% | 11.0% |

Source: Scope Ratings

**x (1 - forward-looking, rating-conditional property price change[6])**

**Figure 5: Example of rating-conditional assumptions on property price changes**

| | Inland – metropolitan cities | | | | | | | | | Inland – rest of provinces | | | Islands | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Level / Region** | Milan (north-west) | Turin (north-west) | Genoa (north-west) | Bologna (north-east) | Venice (north-east) | Rome (centre) | Florence (centre) | Naples (south) | Bari (south) | North | Centre | South | Metropolitan cities | Rest of provinces |
| B | 0.00 | 3.00 | 4.00 | 0.00 | 0.00 | 3.00 | 2.00 | 4.00 | 2.00 | 1.00 | 3.00 | 4.00 | 4.00 | 4.00 |
| BB | 5.00 | 6.40 | 7.20 | 4.00 | 5.00 | 9.40 | 7.60 | 8.20 | 6.60 | 5.80 | 8.40 | 9.20 | 8.20 | 9.20 |
| BBB | 10.00 | 9.80 | 10.40 | 8.00 | 10.00 | 15.80 | 13.20 | 12.40 | 11.20 | 10.60 | 13.80 | 14.40 | 12.40 | 14.40 |
| A | 15.00 | 13.20 | 13.60 | 12.00 | 15.00 | 22.20 | 18.80 | 16.60 | 15.80 | 15.40 | 19.20 | 19.60 | 16.60 | 19.60 |

Source: Scope Ratings

The market-value decline for the B rating level in this example is based on our outlook on the Italian property market and reflects the impact on prices from the Covid-19 crisis.

**x (1 – rating-conditional fire-sale discounts[6])**

**Figure 6: Example of rating-conditional assumptions on fire-sale discounts**

| Level | Residential | Non-residential |
|---|---|---|
| B | 20.0% | 24.0% |
| BB | 22.5% | 27.0% |
| BBB | 25.0% | 30.0% |
| A | 27.5% | 33.0% |

Source: Scope Ratings

[6] We size the B and AAA cases and interpolate values for in-between categories. This table is an example for B to A ratings.
[7] For instance, Italian court valuations (CTU).

**x (1 +/- additional adjustments)**

We also typically apply additional adjustments to factor in other transaction-specific features, such as borrower concentrations, security value reductions for loans secured by second-lien collateral or syndicated loans, qualitative adjustments reflecting our assessment of the servicer's capabilities and the soundness of its business plan, or the quality and independence of the appraisal process (lower haircuts are applicable, for instance, if property appraisals already capture liquidity risk).

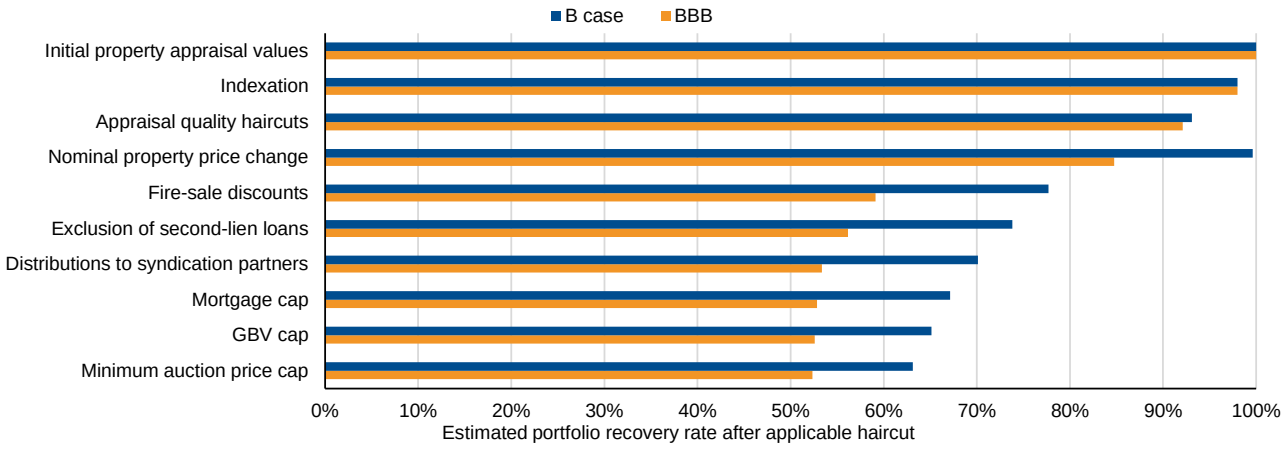
The last step in the analysis is to cap final disposal proceeds at the lower of realisable disposal proceeds, loan gross book value, and the mortgage value:

**Final disposal proceeds =**

Min (realisable disposal proceeds, loan gross book value, mortgage value)

The process is conducted on a line-by-line basis and then aggregated at portfolio level. The chart below illustrates the outcome of such an analysis for a theoretical transaction, under a B case scenario, which is the most likely of the scenarios, and under a BBB rating-conditional stress scenario. Lower recovery rate assumptions under the BBB stress result from our rating-conditional assumptions (e.g. market-value-decline, fire-sale and valuation haircuts). Conversely, recovery caps regarding the gross book value and mortgage amount generally have an impact at lower rating stresses. Note that in this example, we assume the portfolio benefits from a nominal property price recovery under the B case scenario.

**Figure 7: Example of recovery rate assumptions**




Source: Scope Ratings

## Recovery timing assumptions

The next step is to estimate recovery timing. This analysis is also conducted on a line-by-line basis. We assume secured recoveries are received only once.

The total length of a recovery process is mainly determined by the efficiency of the assigned court and the type of legal proceeding. In the following table, Italian courts are grouped into seven categories ranging from the most efficient (group 1) to the least efficient (group 7) in terms of average court timing. Our classification is based on an analysis of official statistics. Most courts are concentrated within groups 2 to 4, which are reasonably distributed across all Italian regions. On average, northern regions tend to have more efficient tribunals.

**Figure 8: Example of assumptions on the length of Italian legal proceedings (in years)[8]**

| Court group | Efficiency | Bankruptcy proceedings | Non-bankruptcy proceedings | Percentage of courts |
|---|---|---|---|---|
| **1** | **Most efficient** | 4.0 | 2.0 | 5% |
| **2** | **Above average** | 6.0 | 3.0 | 32% |
| **3** | **Upper average** | 8.0 | 4.0 | 26% |
| **4** | **Lower average** | 10.0 | 5.0 | 23% |
| **5** | **Below average** | 12.0 | 6.0 | 7% |
| **6** | **Well below average** | 14.0 | 7.0 | 4% |
| **7** | **Least efficient** | 18.0 | 9.0 | 4% |

Source: Scope Ratings' calculations based on Italian Ministry of Justice data

Our recovery timing expectations are typically specific to the transaction, based, among other factors, on the stage of proceedings at closing, the servicer's capabilities, and the eventual applicability of out-of-court workout plans. We also regularly update our statistical analysis on the average market length of recovery proceedings.

Rating-conditionality is captured through stresses (as shown below in years) that are added to the expected recovery timing represented above. For example, a BBB scenario assumption for bankruptcy proceedings in court group 4 would be 12 years, calculated as 10 years (court group 4, bankruptcy proceeding) plus two years (BBB rating-conditional stress, bankruptcy proceeding).

**Figure 9: Example of rating-conditional stresses by type of legal proceeding (in years)**

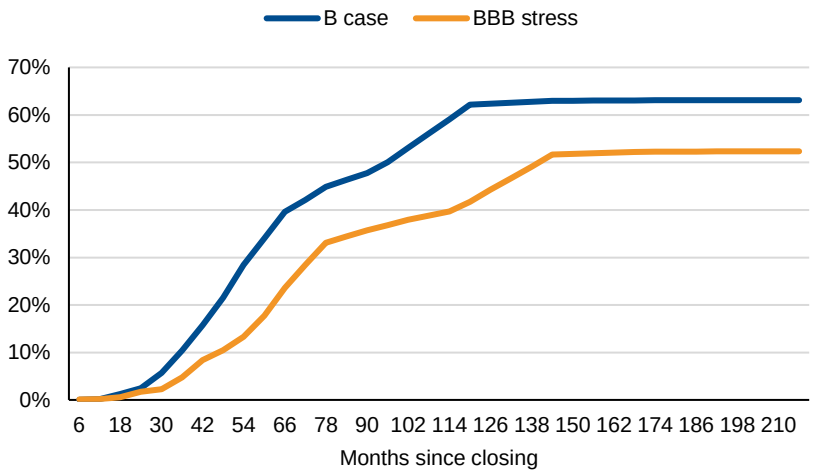
| Level | Bankruptcy proceedings | Non-bankruptcy proceedings |
|---|---|---|
| B | 0.00 | 0.00 |
| BB | 1.00 | 0.50 |
| BBB | 2.00 | 1.00 |
| A | 3.00 | 1.50 |

Source: Scope Ratings

The analysis of the amount and timing of recoveries results in rating-conditional gross recovery vectors. Procedural costs and servicer fees are examples of further layers of stress that we typically incorporate into the transaction's cash flow allocation features to estimate net recoveries. The chart below shows the estimated gross recovery timing vectors for a hypothetical transaction, under a B case and under a BBB stress. The longer recovery timing under the BBB stress mainly results from the added stresses as detailed above. It may also result from transaction-specific adjustments such as the mapping of missing information on proceedings, or from rating-conditional sensitivities to the assumed quality of the assigned courts.

[8] This table is based on cash-in-court distribution timing. Recovery amounts are usually held by the relevant court for a period of time before being distributed to the creditors.

**Figure 10: Example of rating-conditional gross recovery vectors**

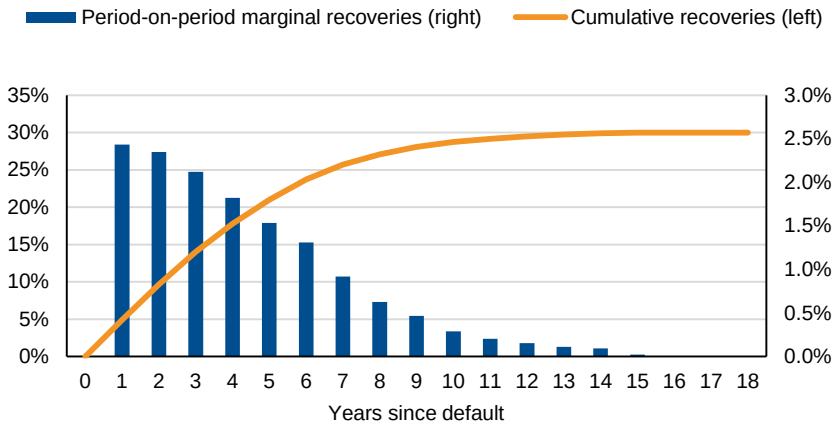



Source: Scope Ratings

### Analysis of the unsecured portfolio segment

The starting point is the analysis of originator- or servicer-specific historical recovery vintage data, which we use to derive expected lifetime recovery rates and timing assumptions. If transaction-specific data is not available, we rely on market-wide data, adjusted to reflect our view on the servicer's capabilities and quality as well as any features specific to the securitised portfolio. We may also adjust our recovery assumptions based on the soundness of the servicer's business plan. If relevant, we split the portfolio into segments (such as small, medium and large loans), or exposures into either bankruptcy or non-bankruptcy proceedings. Portfolio segmentation is relevant if the weights of portfolio segments materially differ to those embedded in the historical vintage data, or if the portfolio is materially exposed to a specific portfolio segment.

**Figure 11: B case lifetime unsecured recovery assumptions**




Source: Scope Ratings

Second, we apply rating-conditional haircuts to expected lifetime recovery rates. Haircuts are tiered to capture higher stresses as the target rating becomes higher. The size of the haircuts is based mainly on the granularity of the underlying data and the stability of recovery rates over time. For instance, assuming the data is sufficiently granular, a AAA haircut generally captures two standard deviations of the observed mean recovery levels. Intermediate rating-level haircuts are derived though an interpolation between the B haircut (0%) and AAA haircut.

**Figure 12: Example of rating-conditional recovery rate haircuts**

| Rating stress | Haircut |
|---|---|
| B | 0% |
| BB | 8% |
| BBB | 16% |
| A | 24% |

Source: Scope Ratings

We also test the sensitivity of the ratings to a lag in recovery timing and, if material, may apply deterministic stresses to extend the weighted average timing of expected collections.

The third step in the analysis consists of deriving loan-by-loan rating-conditional recovery rates over the remaining life, considering the ageing of each position at the time of its transfer to the securitisation vehicle. The higher the ageing of the loan, the lower the expected recovery rate, as marginal recovery rates typically decrease over time. For instance, the chart below shows marginal recovery rates for three different loans under a B case scenario. Loan A recently defaulted at the point of its transfer to the securitisation vehicle, resulting in an expected remaining-life recovery rate of 30% in accordance with the B case lifetime recovery expectation depicted in step 1 above. Loan B defaulted two years before its transfer to the securitisation vehicle, resulting in a lower remaining-life recovery expectation of 22.52%. Finally, loan C defaulted six years before its transfer, resulting in a remaining-life recovery expectation of only 8.25%.

**Figure 13: Marginal recovery rates (B case)**

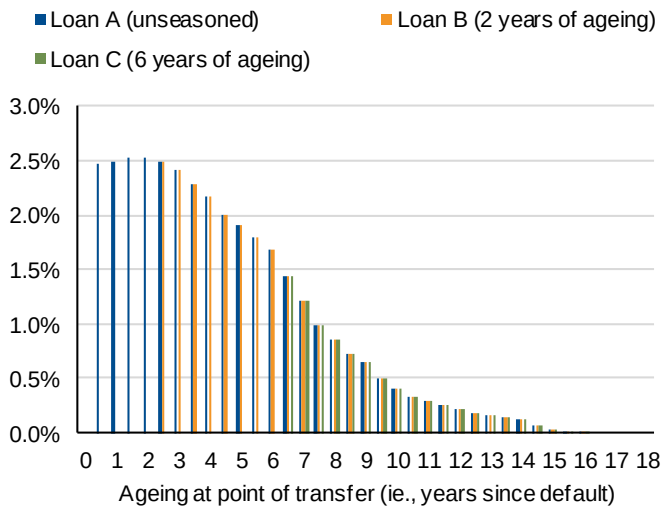
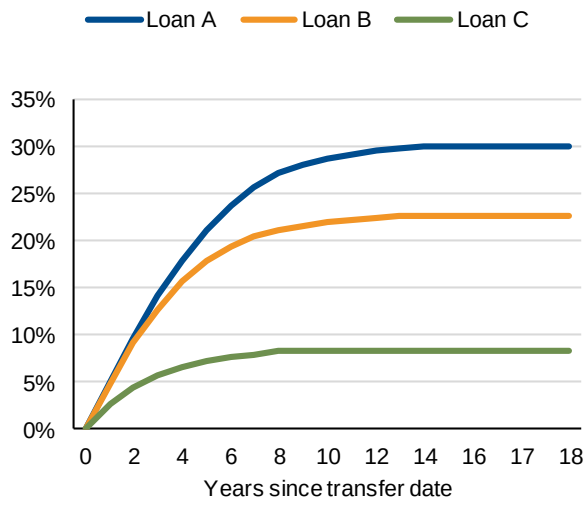


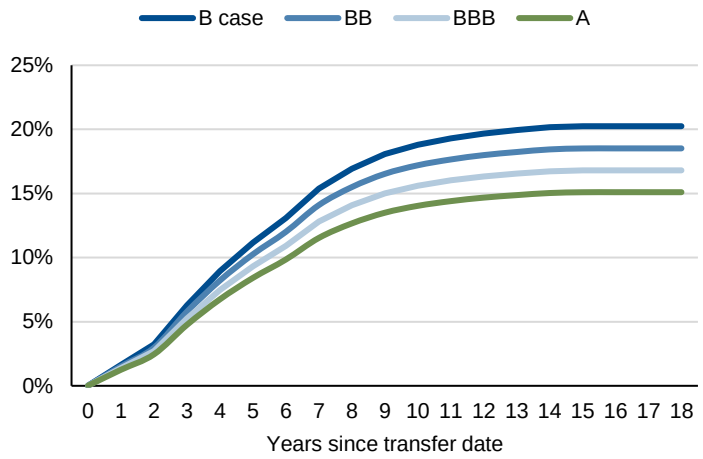

**Figure 14: Cumulative remaining life recoveries (B case)**




Source: Scope Ratings

The final analytical step is to aggregate line-by-line recovery assumptions into portfolio-level rating-conditional recovery vectors which account for the weighted average ageing of the unsecured portfolio.

**Figure 15: Seasoned portfolio recovery assumptions**

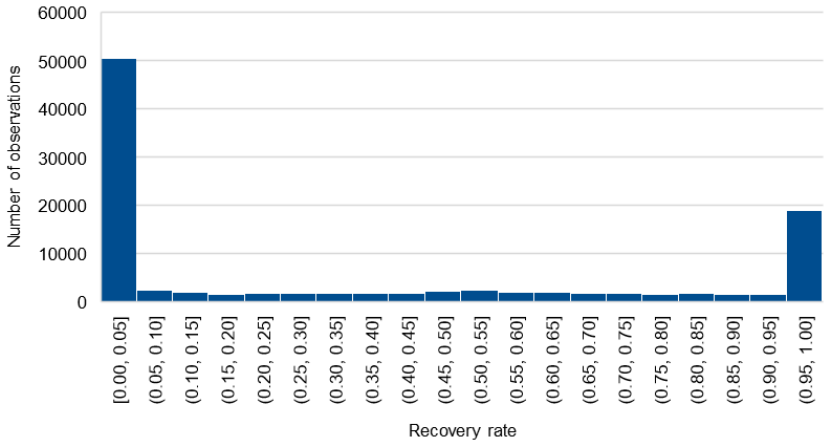



Source: Scope Ratings

## II. Appendix – Illustrative example: stochastic modelling of unsecured loans

Recoveries for unsecured loans might, by nature, be clustered around either full recovery or no recovery with only few intermediate observations. This pattern is confirmed by market data from the Bank of Italy [9]. Figure 16 below provides an example of the distribution of unsecured recovery rates for a representative sample of more than 100,000 unsecured positions observed on the Italian market.

**Figure 16: Distribution of unsecured recovery rates**




Source: Recovery rates for unsecured loans gathered by Scope Ratings

As the average recovery rate is largely driven by fully recovered loans, we simplify the modelling by assuming a loan has either full recovery (100% with a probability of p), or no recovery (0% with a probability of 1-p), with the two outcomes being mutually exclusive. We then use vintage data to construct a distribution for the probability of observing a full recovery of the loans in the pool.

$$Probability\ of\ full\ recovery = p \qquad (1)$$

$$Probability\ of\ no\ recovery = 1 - p \qquad (2)$$

For a portfolio with k number of loans, the expected average recovery rate is as follows:

$$E(r) = \frac{(100\% * p * k + 0\% * (1-p) * k)}{k} = p \qquad (3)$$

For full recoveries, we focus on estimating the distribution of the probability rather than one value of the probability, given that the latter may be unknown.

Before a transaction closes there is usually no data on the pool-specific recovery rate. We normally estimate the average lifetime recovery rate for the pool's unsecured loans (by cluster, if relevant) based on historical data analysis for similar unsecured loans (as described above in section 2.1.2.2). By using equation (3) the average lifetime expected recovery rate can be set equal to the probability of a full recovery (*p),* assuming either full recovery or no recovery for each single loan.

Under a stochastic approach, we consider the different possible values of the portfolio average lifetime recovery rate multiplied by their probabilities of occurrence, as given by the distribution.

The distribution of lifetime unsecured recovery rates does not factor in that unsecured loans (which are sold to the issuer) are often already declared as defaulted for some time before they are sold: the so-called seasoning. As described in section 2.1.2.2 above, future recoveries for loans with a higher seasoning are usually lower than for loans recently declared as defaulted. The final step is to obtain future recoveries by applying a timing vector (see also section 2.1.3.3) for which the recovery rate for each loan is adjusted based on its seasoning.

During the monitoring phase, actual recoveries on unsecured loans will be available together with the updated seasoning for open positions. Consequently, we may update the distribution to incorporate actual performance data. In this way, we can use the new information to update both the mean and volatility of the distribution.

[9] See for example Modelling Downturn Loss Given Default, 2012 Raffaella Calabrese.

## III. Appendix – Indicative data templates

This appendix contains a general template of a data tape with the information we may use in our NPL portfolio analysis.

Please note that the information contained in the template is not exhaustive or required but is intended to serve as an illustration for reference purposes. Other types of information may be more relevant for a given pool. Originators and arrangers are therefore encouraged to contact us if alternative information is available for the rating analysis or if there are any questions regarding the template.

Limited or poor-quality data could affect our ability to rate a transaction.

Link to download the template in Excel.

## Scope Ratings GmbH

### Headquarters Berlin
Lennéstraße 5
D-10785 Berlin

Phone +49 30 27891 0

### Frankfurt am Main
Neue Mainzer Straße 66-68
D-60311 Frankfurt am Main

Phone +49 69 66 77 389 0

### Paris
10 avenue de Messine
FR-75008 Paris

Phone +33 6 6289 3512

### Oslo
Karenslyst allé 53
N-0279 Oslo

Phone +47 21 62 31 42

### Madrid
Paseo de la Castellana 141
E-28046 Madrid

Phone +34 91 572 67 11

### Milan
Via Nino Bixio, 31
20129 Milano MI

Phone +39 02 30315 814

## Scope Ratings UK Limited

### London
52 Grosvenor Gardens
London SW1W 0AU

Phone +44 20 7824 5180

info@scoperatings.com
**www.scoperatings.com**

## Disclaimer

© 2022 Scope SE & Co. KGaA and all its subsidiaries including Scope Ratings GmbH, Scope Ratings UK Limited, Scope Fund Analysis GmbH, Scope Innovation Lab GmbH and Scope ESG Analysis GmbH (collectively, Scope). All rights reserved. The information and data supporting Scope's ratings, rating reports, rating opinions and related research and credit opinions originate from sources Scope considers to be reliable and accurate. Scope does not, however, independently verify the reliability and accuracy of the information and data. Scope's ratings, rating reports, rating opinions, or related research and credit opinions are provided 'as is' without any representation or warranty of any kind. In no circumstance shall Scope or its directors, officers, employees and other representatives be liable to any party for any direct, indirect, incidental or other damages, expenses of any kind, or losses arising from any use of Scope's ratings, rating reports, rating opinions, related research or credit opinions. Ratings and other related credit opinions issued by Scope are, and have to be viewed by any party as, opinions on relative credit risk and not a statement of fact or recommendation to purchase, hold or sell securities. Past performance does not necessarily predict future results. Any report issued by Scope is not a prospectus or similar document related to a debt security or issuing entity. Scope issues credit ratings and related research and opinions with the understanding and expectation that parties using them will assess independently the suitability of each security for investment or transaction purposes. Scope's credit ratings address relative credit risk, they do not address other risks such as market, liquidity, legal, or volatility. The information and data included herein is protected by copyright and other laws. To reproduce, transmit, transfer, disseminate, translate, resell, or store for subsequent use for any such purpose the information and data contained herein, contact Scope Ratings GmbH at Lennéstraße 5 D-10785 Berlin.