



Covered Bond Rating Methodology

Financial Institutions/ Structured Finance

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Call for comments

Scope welcomes market participants' comments on its proposed methodology.
Please send your comments by 8 May 2021 to consultation@scoperatings.com.

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This proposed update of the covered bond methodology clarifies and further refines our analytical approach. The core principles of the rating approach remain unchanged and the methodology as proposed has no impact on existing covered bond ratings.

For most covered bond programmes, public information is sufficient to perform our cover pool analysis, due to more transparency around bank annual reports and the availability of mandatory and voluntary additional cover pool reporting. As such, we propose to remove the limited cover pool analysis from our methodology.

We also propose to amend the cover pool analysis to address the different complexities between the covered bond programmes, by examining the balance between risk and transparency on key risk drivers.

This updated methodology includes the following adjustments:

- a. Reorganisation of content to enhance readability. We have moved the detailed analytical considerations providing information on the qualitative and quantitative analysis from the main text to the appendices;
- b. Clarifications and additional assumptions for the cover pool analysis, including the impact of different transparency levels on the achievable cover pool uplift;
- c. Removal of the 'limited cover pool analysis' for ratings based on fundamental credit support;
- d. Clarification on the depth of the analysis in the course of regular surveillance;
- e. Clarification on typical data expectations; and
- f. Editorial changes.

1. Areas of application

The methodology applies to all covered bonds that benefit from dual recourse, that is, to a financial institution and to a ring-fenced cover pool. Under the first recourse, a financial institution ensures the timely and full payment of interest and principal. Unlike other bank liabilities, covered bonds are exempt from an issuing bank's restructuring or resolution, the common rescue mechanism for a distressed bank. Under the second recourse, the cover pool, a loss is only possible if: i) early supervisory intervention has not helped to stabilise the bank; ii) regulatory capital is depleted and a significant amount of bail-inable debt is converted into capital to ensure continuity for the issuer's business; and iii) the restructured or resolved bank becomes insolvent.

The methodology should be read in conjunction with the General Structured Finance Methodology and other methodologies when relevant¹. This methodology can also be applied to non-European covered bonds.

2. Summary

The covered bond rating methodology provides our framework for the rating assessment and regular monitoring of covered bonds. We apply our rating approach across markets to ensure comparability and consistency. The analysis also incorporates credit features specific to the issuer and the jurisdiction. Our covered bond methodology includes the following analytical steps:

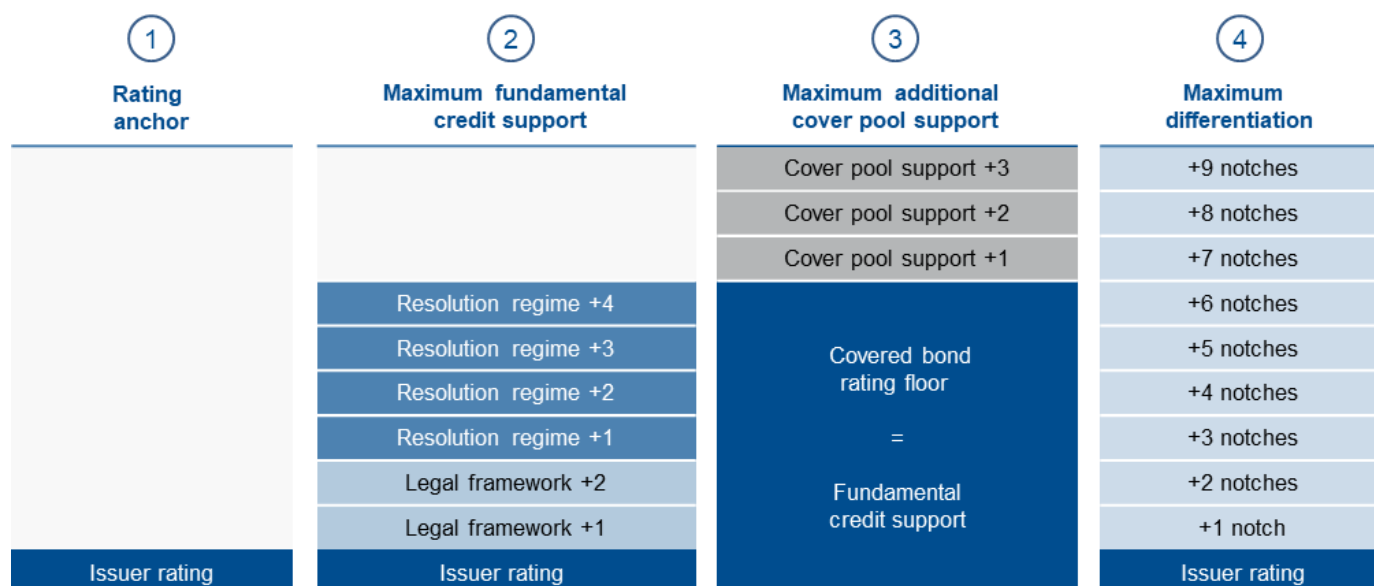
A. The analysis of the issuer results in a bank rating, which is the anchor point for the rating uplift on the covered bonds. The bank rating reflects our view on the likelihood of a regulatory action on the issuer, which is the typical default-like scenario for a bank.

B. Fundamental credit support reflects how legal and resolution frameworks, including systemic importance considerations, increase the likelihood that a covered bond remains a going-concern funding instrument, even upon regulatory intervention in its issuer.

C. Cover pool support is expressed as the expected loss for investors and reflects the credit-positive impact of the second recourse, if needed. The cover pool analysis reflects that a loss is only possible in the event of i) non-payment by the issuer; and ii) an inability of the covered bond structure to ensure full and timely repayment on its own.

¹ Other relevant methodological considerations include our public finance methodologies and other asset-specific methodologies that help to determine inputs into the asset credit risk or structural analysis of a covered bond programme. The methodologies are available on www.scooperatings.com.

Figure 1: Building blocks of Scope's covered bond methodology



Source: Scope Ratings

We limit credit differentiation stemming from cover pool support at three notches above that from fundamental credit support, which can be up to six notches. This reflects the possibility that a cover pool's risk management can significantly change over time. This is because the risk and protection structure remains at the management's discretion even with the limitations imposed by the respective covered bond frameworks. However, we may change our assessment of cover pool support in the below circumstances:

- **A transparency level that curtails the maximum uplift:** The rating uplift from cover pool support depends on i) the interplay of complexity in a covered bond programme's risk and protection structure; and ii) the issuer's willingness and ability to provide investors with detailed information on the composition and volatility of risks. We evaluate this interplay and constrain the maximum uplift based on transparent criteria. We cap cover pool support at the level of fundamental credit support if the need to supplement gaps in data with market-based assumptions is excessive. This could be the case for concentrated and bespoke cover pools or covered bond programmes with significant market and counterparty risks². We may even withdraw the rating if information on the bank issuer, fundamental credit support and cover pool support is significantly constrained³.
- **Higher cover pool support.** A covered bond rating can exceed the issuer rating by more than nine notches. We will increase the uplift if the issuer's influence on a covered bond's risk and refinancing structure is mitigated with features similar to those of a structured finance transaction. A common example is covered bonds that become pass-through after meeting certain criteria and have: i) tight replenishment criteria; ii) risk composition limits at the discretion of the issuer's management; and iii) dynamic, committed overcollateralisation. This means the highest rating a covered bond can achieve could be the same as that achieved by a securitisation with similar asset risk and structural characteristics in the same country.

² See Appendix IX: Impact of cover pool information quality on maximum cover pool support uplift for further details

³ See Scope's Rating Governance Policy available on www.scooperatings.com.

3. Fundamental credit support analysis

The fundamental credit support analysis comprises two areas: i) the legal framework; and ii) the resolution regime and systemic importance analysis. When fundamental credit factors are strong, the covered bonds' credit quality, particularly regarding recovery prospects, far exceeds that of the issuer. For highly rated issuers, fundamental credit support can be the primary rating driver. Fundamental credit support can elevate a covered bond rating by up to six notches above the issuer rating.

3.1 Legal framework analysis

The legal framework analysis covers the relevant aspects before and after an issuer's insolvency. Credit differentiation is based on the clarity of provisions behind the ongoing maintenance of a high-credit-quality cover pool and when the cover pool is the sole source of repayment for a covered bond. The legal framework assessment can result in up to two notches of uplift.

The analysis also considers aspects of the domestic insolvency regimes, regulations that may affect the issuer such as consumer protection laws, the enforceability of cover assets, and other aspects indirectly addressed in the covered bond regulations. More details can be found in Appendix I: Legal framework analysis.

3.2 Resolution regime analysis

The analysis of the resolution regime and systemic importance addresses whether: i) the issuer's balance sheet and capital structure allow regulators to restructure the issuer; and ii) statutory provisions prevent negative repercussions on the covered bond in such a resolution scenario. A systemically important covered bond might mobilise regulators, supervisors and the private sector to support and proactively avoid uncertainty among investors during a resolution. The resolution regime assessment identifies the importance of relevant covered bond types and issuers in each country, allowing us to determine the incentives for market-led solutions. The analysis also addresses support mechanisms of direct stakeholders for the issuing entity that enhance the likelihood of a going concern of the cover pool. Further, we examine the track record of the proactive and transparent use of available resolution and restructuring tools to determine their likely impact on the covered bonds' credit quality.

A resolution regime increases the likelihood that covered bonds remain an actively managed, going concern funding instrument. It reduces the likelihood that an investor needs to solely rely on the cover pool to receive repayments. Consequently, covered bonds in countries with a well-defined resolution regime and where covered bonds are systemically important have a significantly lower probability of default compared to the issuer.

Our resolution regime and systemic importance assessment can result in up to four notches of credit uplift. More details can be found in Appendix II: Resolution regime and systemic importance analysis.

4. Cover pool support analysis

Following our assessment of fundamental credit support, we establish the potential for cover pool support. We generally limit the cover pool-related credit uplift at three notches above that from fundamental credit support. Therefore, a covered bond programme can be up to nine notches above the issuer rating, except for conditional pass-through programmes.

We may constrain the rating uplift attributed to cover pool support. For example, we may grant less than three notches of uplift if available information is not in line with expectations for the given complexity and protection structure (see Appendix IX: Impact of cover pool information quality on maximum cover pool support uplift). If available information is insufficient to perform a high-quality cover pool analysis, the rating uplift will be capped at that gained from fundamental credit support analysis.

The credit strength of the covered bond structure must be enough to counteract the stresses commensurate with the distance between the bank rating and the maximum achievable covered bond rating. The higher the benefit of the cover pool to the covered bond's rating, the more resilient the cover pool's credit performance must be in case of stress.

We use the expected loss of the covered bond programme (see Appendix VI: Determining the expected loss) to establish whether the maximum cover pool uplift is possible. When calculating the expected loss (see Appendix VII: Scope's covered bond expected loss model (CobEL)), we consider two scenarios: i) the bank can still repay the covered bond; and ii) the issuer has defaulted and recourse to the cover pool is needed⁴.

⁴ We conservatively assume that the issuer is in default when cover pool default rates are high, using the dependency copula (the issuer's cumulative default probability is equal to that of the cover pool) to link the two events.

To determine the expected loss, we first perform a credit risk analysis (section 4.1) to identify the relevant asset risks arising from the cover pool and to establish the related inputs for the cash flow risk analysis (section 4.2). We then test the resilience of the covered bond's cash flow structure against stresses commensurate with the issuer rating differentiation in question (D_0 to D_{\max})⁵. We complement the results of the quantitative analysis with auxiliary risk considerations (section 4.3) and a sensitivity analysis (section 4.4) as they can constrain the expected rating uplift.

4.1 Credit risk analysis of cover pool assets

In the first step, we assess the asset and portfolio characteristics to determine the relevant asset risk analysis.

We assess concentrated cover pools using the Scope PM – a Monte Carlo simulation model⁶. This approach analyses the asset risk of public-sector cover pools, diversified substitute asset sub-pools (see Appendix III: Credit risk analysis of public sector and substitute asset) and less granular commercial real estate pools. The analysis calls for asset-by-asset credit projections, with detailed and specific assumptions for each collateral asset.

Our analysis of homogeneous and granular mortgage cover pools use a portfolio approximation approach (parametric default distributions such as normal inverse). Inputs include: i) a measure of mean default probability; ii) a variance or correlation parameter; and iii) recovery rate assumptions. These generic inputs are calibrated based on historical data and adjusted for our qualitative assessments on cover pool assets. We determine asset default and loss distributions by accounting for the credit and performance indicators of the cover pool assets (see Appendix IV: Credit risk analysis of mortgage assets).

For mixed cover pools, we combine the different analytical frameworks. A cover pool made up primarily of granular residential mortgages can be supplemented in certain jurisdictions by commercial real estate and/or up to 20% of 'substitute collateral'. Depending on granularity, we may analyse the credit risk of the different mortgage types either by segment or on aggregate.

4.2 Cash flow risk analysis

Our cash flow risk analysis establishes the expected loss of the covered bond structure using our CobEL model (see Appendix VII: Scope's covered bond expected loss model (CobEL)). We analyse the sensitivity of covered bond cash flows towards increasingly stressed assumptions. We find the minimum overcollateralisation that would result in a lower expected loss than that of the corresponding target rating. If high excess spread allows the rating to be supported below par, we will floor the minimum overcollateralisation at the legal minimum in that country.

Afterwards, we then compare this rating-supporting overcollateralisation against the cover pool's overcollateralisation (see section 5. Overcollateralisation in Appendix V: Cash flow risk analysis). If cover pool overcollateralisation cannot support the corresponding target rating, we reduce the uplift and apply the relevant stresses until it can (see Appendix VIII: Rating-distance dependent stresses).

The cash flow risk analysis looks at scheduled cash flows⁷ and the impact of asset credit and residual market risks (see section 1. Interest-rate risk assessment and 2. Foreign-exchange rate risk assessment in Appendix V: Cash flow risk analysis), the hedging structure, senior costs for maintaining the cover pool's operations, and other relevant cash flow assumptions such as prepayment or reinvestment risk assumptions (see section 6. Other cash flow assumptions in Appendix V: Cash flow risk analysis).

We analyse the cover pool's ability to ensure uninterrupted covered bond payments under the original terms and conditions. However, for a standalone covered bond programme, liquidity shortfalls are most likely in a stressed scenario⁸. In particular, we analyse the impact of stressed asset sales when the cover pool is the sole source of repayment.

For asset sales, we determine the remaining net present value (NPV) of future cash flows generated by the cover pool. We calculate this NPV figure by applying a discount curve and asset-specific liquidity premiums (see section 3. Assessing the Impact of Asset Sale and section 4. Incorporating Asset Liquidity Premiums into the Impact Analysis of Asset Sales in [Appendix V: Cash flow risk](#)

⁵ Starting from the issuer rating or base case (D_0), we apply increasing stresses to the credit, market and refinancing risks. Stresses are linearly scaled depending on the rating distance between the issuer rating and the maximum rating uplift.

⁶ See Appendix III: 'Technical Note on Scope's Portfolio Model (Scope PM)' of the General Structured Finance Rating Methodology, available on www.scooperatings.com.

⁷ If not delivered by the issuer, we project cash flows based on line-by-line or stratified cover pool and covered bond information, complemented with other key credit metrics (e.g. the weighted average life).

⁸ Barring CPT covered bonds whose repayment obligations switch from a bullet to an asset repayment-dependent pass-through.

analysis). From this NPV, we subtract the proceeds needed to repay the next maturing covered bonds. The remaining performing assets are thereby proportionally reduced. The analysis continues until the last covered bond is repaid.

If a covered bond structure prescribes a different mechanism for selling cover assets upon a liquidity shortfall⁹, the cash flow analysis reflects the documented mechanisms. Alternatively, if this option is available, we could factor in the impact of refinancing shortfalls and the use of asset amortisation to repay a liquidity line.

4.3 Auxiliary credit considerations

We may adjust the quantitative results and the resulting uplift based on additional credit considerations. Where relevant, we will include ESG risk considerations into our credit and cash flow risk analyses (see Appendix XI: ESG impact analysis). The relative significance of country risk considerations may also influence and ultimately constrain the results of the quantitative analysis (see Appendix XII: Country risk considerations).

We also determine whether the credit strength of external counterparties providing financial or operational services could have a severe impact on the performance and, ultimately, the creditworthiness of a covered bond. These credit considerations are factored into the cash flow risk analysis if mitigating measures are inadequate, for example, a weak alignment of interest with the covered bond issuer. Ultimately, inadequate protection against counterparty risk could constrain the cover pool support rating uplift (see Appendix XIII: Counterparty risk considerations).

4.4 Sensitivity analysis

The static cash flow analysis is complemented by additional analyses reflecting our forward-looking views on the potential development of the cover pool structure as well as analyses to identify the key credit and cash flow variables driving the credit performance of the covered bonds. We might test for the impact of new issuance activity on mismatches, the sensitivity of the rating to changes in overcollateralisation as well as the impact of changing asset risk structures. High sensitivities against these variables can result in both the rating and the rating-supporting overcollateralisation being adjusted to ensure rating stability.

4.5 Monitoring

We analyse the cover pool 'as is' at the time of the reporting. We would, however, adjust the current composition for changes to cover pool composition as communicated by the issuer, or if our forward-looking view suggests the need to amend key pool characteristics. Changes often relate to new business strategies (e.g. entry into new segments, or the introduction of loan products with different terms and conditions), regulatory changes (e.g. certain asset types become ineligible), or mergers and acquisitions resulting in a shift in the covered bond programme's risk profile. We update the asset credit analysis at least annually unless the cover pool has not changed materially. Credit measures for a cover pool typically have low volatility because of the stable underwriting criteria, the long maturities of cover pool loans, and the large sizes of most cover pools, which reduce the impact of replenishment (see Appendix XIV: Monitoring guidelines).

⁹ Such as the Selected Asset Required Amount – SARA clause – or Supplemental Liquidity Reserve Accounts – SLRA

Appendix I: Legal framework analysis

In the first part of the fundamental credit support analysis, we analyse whether the legal framework establishes:

- Clear, legally valid, binding and enforceable segregation as well as maintenance of cover pool assets and related derivatives upon the issuer's resolution or insolvency (for on-balance-sheet structures), or a valid perfection of transfer and a true sale in the case of covered bonds that use an SPV structure.
- Standard documentation on the covered bond structure's ability to continuously make payments of interest and principal and payments on derivatives according to the original terms and conditions¹⁰, even in the event of a resolution, moratorium, or insolvency regarding the issuer. Furthermore, we expect privileged derivatives and liquidity facilities contracted for the benefit of covered bonds to remain upon a regulatory-driven restructuring, moratorium or insolvency of the bank, as well as no automatic acceleration of the covered bonds if an issuer defaults or is placed under a moratorium.
- Asset eligibility criteria that ensure high-credit-quality assets are included and maintained in the cover pool and that documented risk management principles address market and liquidity risks prior to and after insolvency.
- Requirements that programme enhancements remain available, valid and enforceable vis-à-vis other creditors after a resolution event or insolvency (i.e. overcollateralisation that is higher than either the statutory minimum or other maintenance obligations).
- Requirements that neither a regulatory action nor an issuer's event of default impacts the ability to manage the covered bond structure in the best interest of investors. The framework should allow proactive liquidity management for the benefit of covered bond holders. We will examine how, in the case of a regulatory action or an insolvency, a potential conflict of interest between covered bond holders and other debtors is resolved.
- Independent and regular oversight of the programme structure (asset composition/structural risk) by either the supervisor or a special trustee.

The European covered bond harmonisation¹¹ will provide more consistency in the general legal frameworks applicable to covered bonds and ensure basic principles are met. However, current differences between common and civil law systems, mortgage markets and national discretion in the directives' transposition mean that our legal framework analysis remains specific to the country and, possibly, the issuer.

Credit differentiation

- We may grant the covered bonds the maximum two notches of uplift above the bank rating for this analytical area if the respective legal framework ensures: i) upon the issuer's insolvency, covered bonds benefit from a segregated cover pool that allows ii) the uninterrupted payment of interest and principal on covered bonds after an issuer's insolvency. Further, iii) documented risk management principles that address the assets' credit, market and liquidity risks prior to and after the insolvency are iv) buffered by overcollateralisation that remains fully available after insolvency. In addition, v) the covered bond structure is regularly monitored by an independent trustee or supervisor.
- If the characteristics from i) to v) above only apply partially, we may limit the credit differentiation. For instance, if covered bonds were to accelerate upon the insolvency of the issuer from either contractual or statutory provisions, we might grant a maximum uplift of one notch for the legal framework. Still, full credit differentiation is highly unlikely in the absence of dedicated oversight. This limitation reflects the fact that some of the main expectations of a covered bond, such as uninterrupted payment after insolvency or special oversight, are not met¹².

¹⁰ Terms and conditions include both the provisions set out in the legal framework as well as programme- and issue-specific terms and conditions.

¹¹ Directive (EU) 2019/2162 comprises the principles based on the Covered Bond Directive and a Regulation amending the Capital Requirements Regulation (CRR) regarding the exposures in the form of covered bonds. Passed by the European Parliament in 2019, it has to be transposed in member states by July 2020 and becomes mandatory for new issues from July 2021.

¹² Acceleration will not mechanistically cap the potential cover pool support uplift because the expected-loss rating definition factors in both the likelihood of a default and loss severity upon default. However, lower proceeds due to the very swift realisation of the cover pool upon acceleration generally limits the benefit of the cover pool analysis – compared with an orderly covered bond wind-down.

Appendix II: Resolution regime and systemic importance analysis

In the second part of the fundamental credit support analysis, we assign up to four notches of uplift to reflect a high likelihood that an issuer can maintain covered bonds as a going-concern funding instrument.

Credit differentiation

The likelihood that regulatory intervention would preserve the covered bond's credit quality is a key determinant for the associated credit uplift. Factors include:

- Whether the covered bonds are defined in line with statutory provisions in resolution regimes and thus are not impacted by regulatory intervention; or whether, in the absence of formal resolution tools, regulators or other market stakeholders are still more likely to support a (re)resolution that avoids bank failure and an adverse impact on the covered bonds.
- Whether the issuer's business model, systemic importance, liability and capital structure, level of bail-inable debt or incentives suggest regulators will likely use available resolution tools to restructure the issuer in a way that keeps the covered bond programme as a going concern. In this context, we also look at the extent and sustainability of support provided by stakeholders (including the issuer's shareholders). This includes documented liquidity lines, guarantees, maintenance of the cover pool's quality and overcollateralisation as well as service and operational agreements.
- Whether covered bonds are systemically important (i.e. used by most banks in a country) and whether this covered bond type is the main refinancing tool for an economically important asset. We also assess whether the issuer is a relevant covered bond issuer and whether covered bonds are an important asset class for domestic investors.
- Whether there is an active domestic stakeholder community (regulators, issuers and investors) that proactively monitors market developments, actively maintains confidence in the product, and possibly encourages improvements in the relevant regulations. In addition to the indirect stakeholders, the analysis also addresses the incentives of direct stakeholders (e.g. shareholders), or documented support mechanisms provided by the direct stakeholders to the issuing entity, that enhance the likelihood that covered bonds continue as going concern. Examples of mechanisms are asset replacement, liquidity support, minimum overcollateralisation and servicing agreements. We assess the clarity and predictability of relevant statutory provisions and the relevant authorities' interpretation of and track record in these.

If the above factors are fully met, regulatory action on the issuer is unlikely to impact a covered bond as a going concern instrument. This results in a significantly reduced likelihood of default, and thus a lower expected loss, translating into up to four additional notches of rating uplift for the covered bonds. If the above elements apply only partially, the benefits of the resolution regime will be limited, reflecting the increased likelihood of the covered bond being wound down and the cover pool becoming the sole source of repayment. For resolvable banks, the liquidity assessment, including its ability to repay covered bonds on time, reflects that a bank in resolution needs to remain liquid and will benefit from central bank financial support as long as it is solvent.

Application in countries without a dedicated resolution framework

For countries without a specific resolution framework, we assess whether supervisors follow a similarly proactive, transparent and predictable resolution approach for a covered bond issuer that requires closer monitoring and is likely to become insolvent. We assess whether a covered bond issuer is more likely to be declared insolvent or whether the general aim is to maintain an issuer and its covered bonds as a going concern.

Appendix III: Credit risk analysis of public sector and substitute assets

1. Portfolio default risk analysis

We use the Scope PM to analyse all public sector cover pools and diversified substitute asset sub-pools. The Scope PM analysis framework allows us to estimate default statistics for less homogeneous cover pools, considering the exposure-by-exposure credit quality, amortisation profile and asset correlation assumptions. We use line-by-line cover pool information to analyse the credit risk of public sector exposures. In case only stratified information is available, we analyse a proxy portfolio reflecting the main credit metrics of the pool (e.g. by geographical breakdown, debtor types, granularity, amortisation profile).

Public sector cover pools may have large single-asset exposures with different concentrations and idiosyncratic risks. For larger exposures, we use our public or private ratings (generally for exposures larger than 10% of the cover pool) or credit estimates (for exposures between 5% and 10% of the cover pool). For granular exposures below the sovereign level and sectors typically found in public sector cover pools (e.g. hospitals or utilities that are majority owned or guaranteed by the public sector), our sector experts establish relative rankings of credit risk specific to the sector and exposure¹³.

When mapping granular exposures, we may use the issuer's internal credit analysis or our own expert-driven credit assessment. Generally, we reflect an issuer's weaker credit assessment of an exposure, taking into account the issuer's more direct relation to the obligor.

Figure 2: Preferred method to assess and monitor credit quality of cover pool assets

Top obligor concentration (% of cover pool balance)	Credit quality derived from:
Less than 2%	Mapping of external credit risk measures available to Scope ¹⁴
Less than 5%	Mapping an individual outcome validated by Scope analysts
Less than 10%	Credit estimate or similar assessments by Scope or its affiliates
10% or more	Public or private ratings

Source: Scope

2. Analytical approach for granular public sector exposures

The portfolio credit analysis using Scope PM establishes credit assessments for cover pool exposures. Public sector cover pools may comprise granular and non-publicly rated sub-sovereign exposures or exposures to government-related entities. In this situation, we establish credit risk measures for the generic asset 'types'¹⁵.

Our individual credit assessments for exposure types representing below 5% of the cover pool start with our sovereign rating or a similar credit assessment. Our sector experts analyse the respective institutional framework, focusing on: i) institutional support; ii) fiscal interlinkage; and iii) political alignment between the government tiers.

The strength of the institutional framework results in an indicative ranking range for regions – the stronger (weaker) the framework, the narrower (wider) the range vis-à-vis the respective sovereign rating. We rank the regions and adjust the distance to the sovereign rating based on, for instance, blended ratios including GDP per capita, (measured as a percentage of the euro area average) or the regional unemployment rate. Scope analysts may use different references for non-European exposures or make adjustments reflecting regional differences.

We also use our institutional framework assessment for the initial evaluation of lower-tier exposures such as municipalities. Like for regions, we establish adjustments across the board – the stronger (weaker) the framework, the lower (greater) the adjustment vis-à-vis the respective sovereign rating. This adjustment is a starting point and refined in a second step. Additional upward or downward adjustments can reflect additional regional indicators such as the population, GDP per capita (as a percentage of the euro area average) and the unemployment rate.

¹³ Ratings, credit estimates as well as relative rankings are established based on the principals of the relevant methodologies (e.g. Rating Methodology: Public Finance Sovereign Ratings; Rating Methodology: Sub-Sovereign Credit Rating or Rating Methodology: Government Related Entities); rankings are typically provided on a scale from 1 to 20.

¹⁴ Internal rating models of the originator or public ratings from ECAs. We may use those credit measures and adjust them as necessary.

¹⁵ Types refer to small individual exposures to government-related entities in a specific region that share similar credit characteristics.

For public sector or public sector-guaranteed companies, our starting point generally consists of the credit risk assessment of the public sector guarantor or majority owner. For companies that benefit from a direct, unconditional and irrevocable guarantee, we generally align the credit opinion with its direct guarantor. For other eligible public sector exposures, we may make a negative adjustment depending on the relationship between the sponsoring public sector entity and the respective cover pool exposure (based on the entity's legal status and the impact of the liability support mechanism or shareholder structure). For insignificant individual exposures, we may apply conservative assumptions, e.g. unclear ownership structures or only implicit liability support.

3. Analytical approach for substitute assets in cover pools

Many cover pools include substitute assets¹⁶, as covered bond frameworks stipulate that liquidity risk be covered within the first 180 days. The share of substitute assets is limited to 20% of the cover pool and eligible assets have regulatory minimum credit quality requirements¹⁷. Issuers apply more dynamic management to the composition of substitute assets than for the rest of the cover pool.

For diversified substitute-asset sub-pools, our credit risk analysis is generally the same as for diversified public sector cover pools. The exception is when the share of substitute assets is below 5% of the total cover pool as of the reporting date and/or the effective number¹⁸ is less than or equal to 5. In such instances, we conservatively assume the sub-pool as a single exposure against a financial institution and use the minimum credit quality stipulated by the covered bond legislation, combined with a typical three-year maturity to derive the substitute assets' probability of default.

4. Portfolio correlation assumptions

Correlation parameters are essential to the Gaussian copula function used to obtain a portfolio's default rate distribution. For each iteration of the Scope PM's Monte Carlo simulation, we determine asset defaults by comparing a random asset value against a defined threshold derived from the asset maturity and Scope obligor rating. This random asset value is constructed as a standard Gaussian random variable, defined as a linear combination of standard independent Gaussian random variables. The independent Gaussian random variables comprise a set of market risk factors and an asset-specific component.

Three market risk factors define our default dependency framework, or correlation framework, for public sector and substitute-asset cover pools:

- Global: this reflects macroeconomic influences.
- Country: this high-level geographical factor reflects a common dependency on general economic and political developments domestically.
- Local: obligors active in the same region or industry often have the same business cycle and perspectives.

We use the weights attributed to each factor to determine the interdependence between the public sector entities and reflect the different transfer mechanisms between the sovereign and sub-sovereigns, oversight or guarantee structures. Larger weights on market risk factors imply smaller idiosyncratic risk and contribute a higher probability of widespread default in the collateral pool.

Our indicative average correlation parameters for concentrated cover pools are set out in Figure 3.

Figure 3: Indicative average correlation parameters for concentrated cover pools

Market risk factor	Correlation parameter
Global	2.0%
Country	5.0% to 22.0%
Local (region, industry or type)	10.0%

¹⁶ In general, public sector cover pools could also have a sub-pool of substitute assets. However, as most public sector cover assets already qualify as liquid assets, substitute assets are less common for mortgage covered bonds and often only comprise unsecured exposures to banks or covered bonds.

¹⁷ The EU covered bond directive requires a minimum credit quality step (CQS) of 2, which is equivalent to a minimum rating of A-. Short-term exposures with maturities below 100 days also can comprise exposures commensurate CQS3 which can be as low as BBB-. Eligibility criteria typically stipulate that such assets can be sovereigns, sub-sovereigns, other covered bonds, or exposures to regulated financial institutions.

¹⁸ Defined as the inverse of the Herfindahl-Hirschman Index (HHI) of the percentage weights

We consider these correlation parameters in the context of European public sector cover pools and eligible substitute assets. If the composition differs significantly, we may adjust the correlation framework or its components for this additional risk. For example, we may apply top obligor stresses, for which we increase the correlation for the largest obligors.

5. Recovery rate assumptions for public sector exposures in cover pools

Recovery rates applied to public sector assets reflect stresses that depend on the rating distance between the issuer and the covered bond rating. Recovery rates used in the cash flow simulation reflect the weighted average recovery rates of the individual exposures. Stressed recovery rates are linearly scaled between the base case (D_0) and the highest achievable rating distance D_{\max} ¹⁹. We generally assume full recovery of defaulted public sector exposures in the base scenario prior to applying rating-distance-dependent stresses (D_0 recovery = 100%). In the most severe stress scenario, we apply asset- and country-specific public sector recovery assumptions. These reflect the borrower's guarantee structures, country-specific transfer and equalisation systems, and the tiering of public-sector exposures. Based on academic research, we generally assume the lowest recovery rates (D_{\max} stress) for sovereign exposures with a 40% recovery expectation; for sub-sovereigns and municipalities, the stressed recovery rates can be as high as 80%. We assume 50% for public sector companies and other eligible guaranteed exposures. Assumptions reflect the most severe stresses applied in the D_{\max} scenario. Recovery assumptions are designed to assess public finance risks in the specific context of both the cover pool support analysis and the cash flow modelling approach²⁰.

6. Recovery timing assumptions

Public finance insolvency processes generally differ from those in the private sector. For example, the process in the public sector can take longer; exposures become restructured rather than proceeds from a foreclosed security being received in a lump sum; investors need to make concessions on their interest; and maturities become extended. We assume that public sector payment obligations (principal and interest) would be placed under a moratorium. Following the end of the moratorium, payment obligations would be reinstated at the assumed stressed recovery rate (principal and interest) and the original terms and conditions would be extended by the length of the moratorium. We conservatively assume a moratorium to last 48 months.

Substitute assets may also comprise assets for which we apply different recovery timings. For example, the recovery timing analysis for covered bonds secured by mortgages will be in line with that of the respective asset type.

¹⁹ Assuming the issuer is rated BBB- and the fundamental framework analysis results in an uplift of six notches, the cover pool analysis would allow an additional credit differentiation of three notches. This translates into a maximum rating distance of nine notches between the bank rating and the covered bond rating. The stress scenario commensurate with the highest elevation is denoted in this example as the D_9 stress scenario.

²⁰ A very high recovery rate can still apply significant stress to the covered bond's cash flow. In our simulations, even a 100% recovery would lead to an NPV and thus, expected loss due to the longer maturity of the cash flows. The cash flow profile may become further stressed, however. Scheduled asset proceeds needed to pay interest or repay principal would be unavailable because of the moratorium. To allow timely payment to continue, a cover pool manager might therefore need to undertake a fire sale of cover assets. Our asset sale simulation generally adds stresses as it incorporates: i) stressed interest-rate and foreign-exchange scenarios; and adds ii) a liquidity premium (see [Appendix V: Cash flow risk analysis](#)).

Appendix IV: Credit risk analysis of mortgage assets

1. Analysis of granular mortgage cover pools

Our preferred method for analysing the credit risk of mortgage-backed loans depends on the homogeneity of the cover pools. We analyse cover pools comprising granular mortgage loans using a portfolio approximation approach with the following inputs: i) a measure of mean default probability; ii) a variance or correlation parameter; and iii) recovery rate assumptions. We also apply this approach to pools of granular, homogeneous commercial real estate-backed mortgage loans. For less granular commercial portfolios with mixed homogeneity (particularly with a cross-country or non-standard asset mix), we may apply our portfolio analysis framework using the Scope PM (see section '2. Analysis of concentrated mortgage cover pools' below).

1.1. Portfolio default projections

We analyse the default pattern of granular mortgage pool portfolios using an inverse Gaussian distribution characterised by a mean and a coefficient of variation. We use issuer or country-specific performance information²¹ and the asset characteristics of the relevant sub-portfolios to: i) directly establish lifetime default rate assumptions and a coefficient of variation²² for the respective asset type (e.g. by using vintage data); or ii) calibrate country-specific assumptions for similar asset types (e.g. by using delinquency information).

When calibrating assumptions on mean default rates and the coefficient of variation (when data is available), we may compare the market's delinquency data to the issuer's delinquent loan information, which most banks report regularly (ideally based on a 90-days-past-due definition). We use available data to establish a dynamic relation for adjusting the synthetic vintage data. We may use representative information on cover pool exposures or borrowers to establish default and loss distributions. Examples of product- or borrower-specific default drivers are:

- The financed property type (e.g. owner-occupied versus buy-to-let);
- The seasoning of the loans;
- Whether the property is used for residential or commercial purposes (and the type of commercial property);
- The repayment type (amortising versus interest-only); and
- The property's loan-to-value ratio.

Depending on underwriting practices in the relevant country (when data is available), we may also use borrower-specific default drivers based on the debt-to-income ratio, employment status, age, or employer type. We may use such information to further differentiate the borrower's default risk.

1.2. Recovery rate assumptions

We derive mortgage loan recoveries by calculating the security value as the stressed value of the underlying residential real estate. Our fundamental recovery analysis primarily involves such aspects as: i) an estimate of the collateral's current value (typically by indexation); ii) a haircut on the asset's current value via market value declines (rating-distance-conditional); and iii) additional haircuts (e.g. fire-sale discounts, liquidity adjustments) and costs. Steps ii) and iii) are embedded in the total security value haircut.

We may substitute this approach with a statistical analysis of recovery vintage data or other historical data on the recovery rates of similar assets, when available.

²¹ At a minimum we use performance information from the issuer's annual accounts or country-specific information on unemployment (as provided by the IMF) and mortgage and rent arrears (as provided by Eurostat or similar statistical agencies).

²² The coefficient of variation is defined as the standard deviation divided by the mean.

1.2.1 Market value declines for mortgage collateral

Our fundamental approach to deriving property price assumptions involves three steps. First, we estimate the long-term sustainable levels and a sustainable growth rate (SGR) for nominal property prices, incorporating information embedded in metrics relating to property affordability, property profitability, private sector indebtedness, the credit cycle, population dynamics, and long-term macroeconomic performance. Second, we deflate nominal prices using the sustainable growth rate and calculate the average historical SGR-deflated price. Lastly, we analyse the historical volatility of the SGR-deflated-price time-series to derive distance-conditional market-value-decline assumptions.

The base case market-value decline captures the distance between current and historical average SGR-adjusted prices and factors in current market conditions (e.g. credit expansion or credit contraction). It allows for the possibility of a slow reversion to mean prices. As a result, a base case market-value decline may not necessarily reflect the distance between the current price and the historical average. The market-value declines we assume for the highest stresses capture the distance from the current SGR-deflated price to the average historical SGR-deflated price, plus an additional stress to capture historical price volatility. This stress level is typically based on two standard deviations from the average historical price. We may apply higher stresses and market-value-decline caps or floors to address data limitations, such as non-stationarity or too short historical time series.

The market value declines apply to indexed property values according to the relevant house price indexation curves. Hence, our analysis considers any price corrections to date.

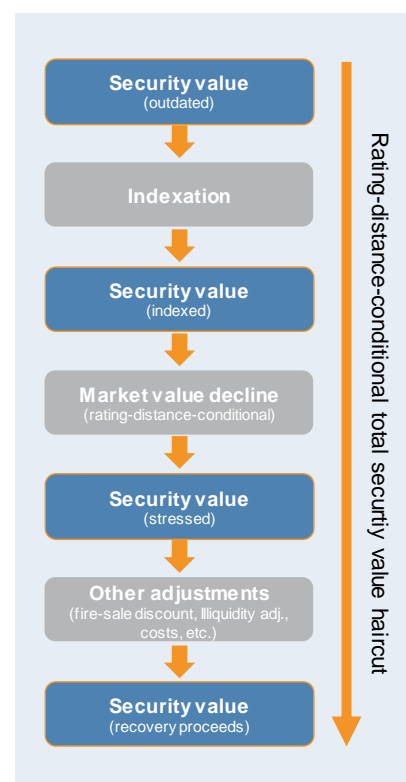
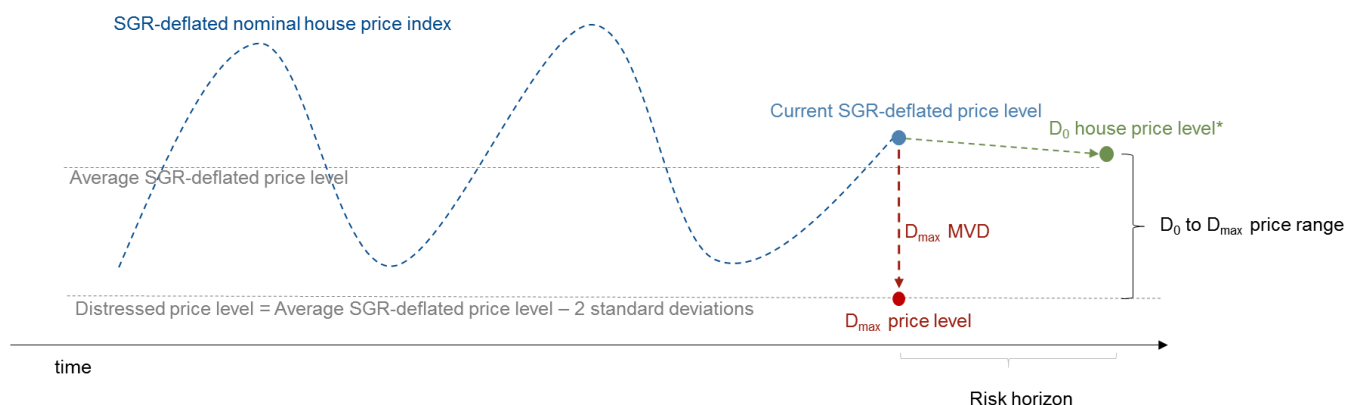


Figure 4: Market-value-decline analysis



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

The analysis of recovery rates for commercial real estate mortgages is also based on updated values of the properties securing the loans. Our recovery analysis for commercial real estate loans is aligned with our market-value-decline analysis for residential properties, provided that the granularity of available information is also high.

We may, however, apply an additional haircut to reflect the lower liquidity or quality of commercial assets, as illustrated in Figure 5 below. On average, these fixed market-value declines translate into fire-sale discounts that materially exceed those derived from detailed information on the obligors and the commercial properties securing the loan.

Figure 5: Additional fire-sale discount (FSD) for commercial real estate

$$\text{Available money} = [\text{Appraisal} \times (1 - \text{MVD}) \times (1 - \text{FSD})] \times (1 - \text{Additional CRE FSD})$$

1.2.2. Recovery rate tiering

Recovery rates generally decrease as the distance between the issuer and the covered bond rating widens. This also ensures that covered bonds with a stronger credit quality can withstand more volatile realised recovery rates.

Figure 6 provides an example of indicative recovery rate haircuts that we use and where the base case recovery analysis makes use of stratified portfolio vintage information. If we assume a base case recovery rate of 50% and analyse portfolio losses under highest stresses, the maximum stressed recovery rate would be 30% = 50% x (1-40%).

Figure 6: Indicative recovery rate haircuts for a maximum rating differentiation

Rating stress	D_0 (base case)	D_{\max}^{23} (stressed)
Haircut	0.0%	40.0%

For recovery analyses on a loan-to-value basis, we apply rating-distance-conditional market value declines. The highest market value declines range between two and three standard deviations for D_{\max} stresses. Such severities are similar to those applied for the highest achievable ratings in structured finance.

1.2.3. Recovery timing

For mortgage assets, we generally assume a 24-month recovery lag following loan default. The workout period may reduce to 18 months for highly liquid countries and regions in which foreclosure and collection processes are digitalised and efficient. On the other hand, inefficient foreclosure and collection processes or illiquid markets have a negative impact on the recovery timing. Mortgage loans ultimately guaranteed by a sovereign body may also result in a recovery timing assumption of 36 months or longer. When available, we consider statistical data.

2. Analysis of concentrated mortgage cover pools

2.1. Portfolio default rate analysis

For concentrated commercial mortgage cover pools, we use the Scope PM's analysis framework. We estimate default statistics for cover pools with low granularity by factoring in the exposure-by-exposure credit quality, amortisation profile and asset correlation assumptions. We use line-by-line cover pool information. In case only stratified information is available, we establish and analyse a proxy portfolio reflecting the main credit metrics of the pool (i.e. geographical breakdown, debtor types, granularity, amortisation profile).

Single exposures in commercial mortgage pools are generally larger than those in typical residential financing. At portfolio level, however, single exposures typically remain granular enough that we can use outcomes from the originator's internal rating models or conservative sector assumptions for our portfolio model's default analysis. In cases of high concentrations on top obligors, we perform additional analyses based on the principles in our CRE Security and CMBS Rating Methodology²⁴.

The analysis of concentrated mortgage portfolios follows our principles for public sector cover pools. However, as SMEs or corporates often take out large mortgage loans, we align the correlation parameters to those typically used for similar obligors as per our CLO methodology²⁵. Weights attributed to each factor determine the interdependence between the different borrowers. Indicative average correlation parameters for concentrated commercial mortgage pools are set out in Figure 7.

Figure 7: Indicative average correlation parameters for concentrated commercial cover pools

Market risk factor	Correlation parameter
Global	2.0%
Country	5.0%
Local (region, industry or type)	10.0% to 20.0%

For cover pools with a low diversification or specific industry focus, we adjust the correlation framework or its components. For example, we may apply top obligor stresses, for which we increase the correlation for the largest obligors.

²³ Rating stresses for scenarios between D_0 and D_{\max} are determined by linear interpolation.

²⁴ See www.scooperatings.com for further information on the [CRE Security and CMBS Rating Methodology](#)

²⁵ See www.scooperatings.com for further information on the [CLO Rating Methodology](#)

2.2 Recovery rate analysis

Our recovery rate calculation does not differ between granular and concentrated mortgage pools²⁶. See section 1.2. for more details. We may apply an additional haircut on the top obligor's recovery rate.

²⁶ In case of high concentrations on top obligors, we will perform additional analyses based on the principles laid down in our „CRE Security and CMBS Rating Methodology“

Appendix V: Cash flow risk analysis

Our cash flow analysis includes a projection of defaults and loss-given-default from the cover pool. The main credit-related parameters include default distribution, the amortisation profile, default timing, recoveries, and recovery timing. The analysis also incorporates market-scenario parameters such as interest-rate and foreign-exchange term structures as well as stressed refinancing assumptions. We apply the same concept of rating-distance-dependent stresses to market risks such as interest-rate and foreign-exchange risks as well as the liquidity premium²⁷.

1. Interest-rate risk assessment

We test the resilience of the covered bond structure against adverse interest-rate developments. We use a set of deterministic, adverse interest-rate scenarios to identify the scenario that most severely impacts expected loss, as shown below.

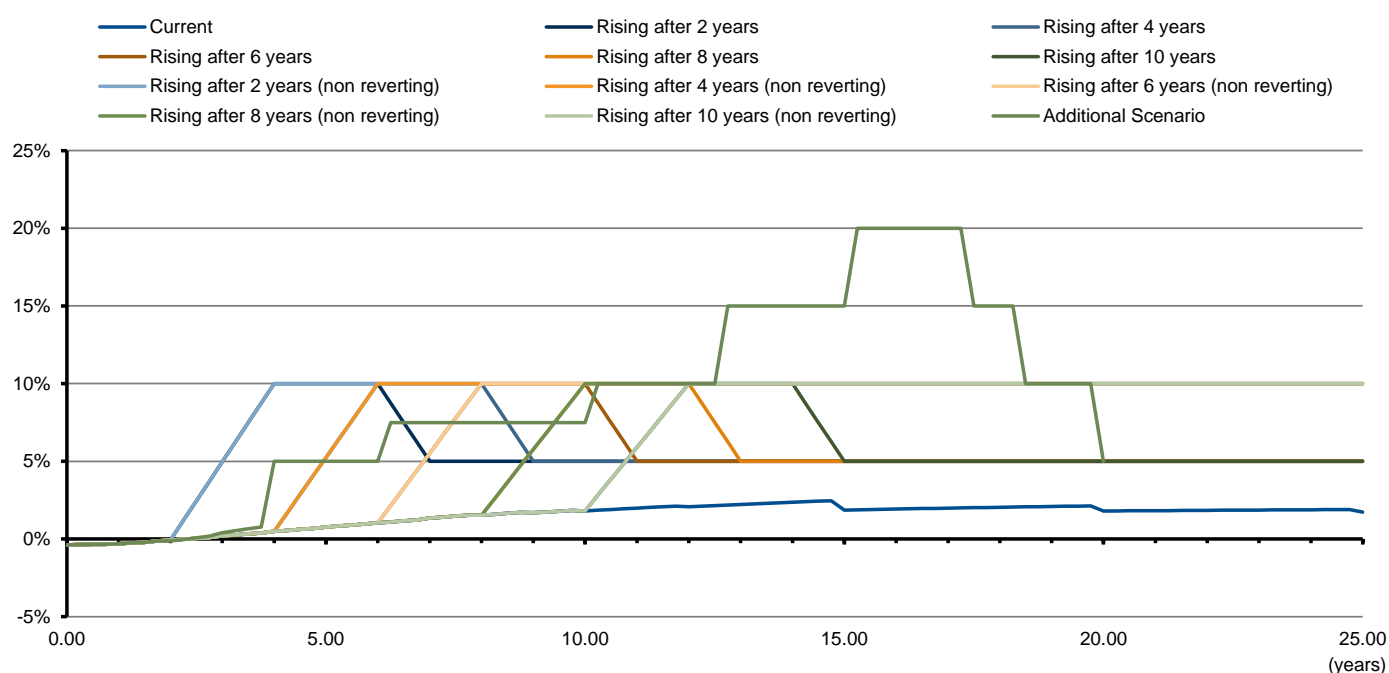
The current interest forward rates are the starting point of our cash flow analysis. We modify for expected developments of the interest rate starting from points between the second and 10th years of the covered bonds' residual life.

We then stress the interest rates to 10% and/or minus 1%.

For both upwards (Figure 8) and downwards (Figure 9) scenarios, the stressed rates are maintained for a period of two years, after which they start to revert to what we expect to be a long-term mean interest rate.

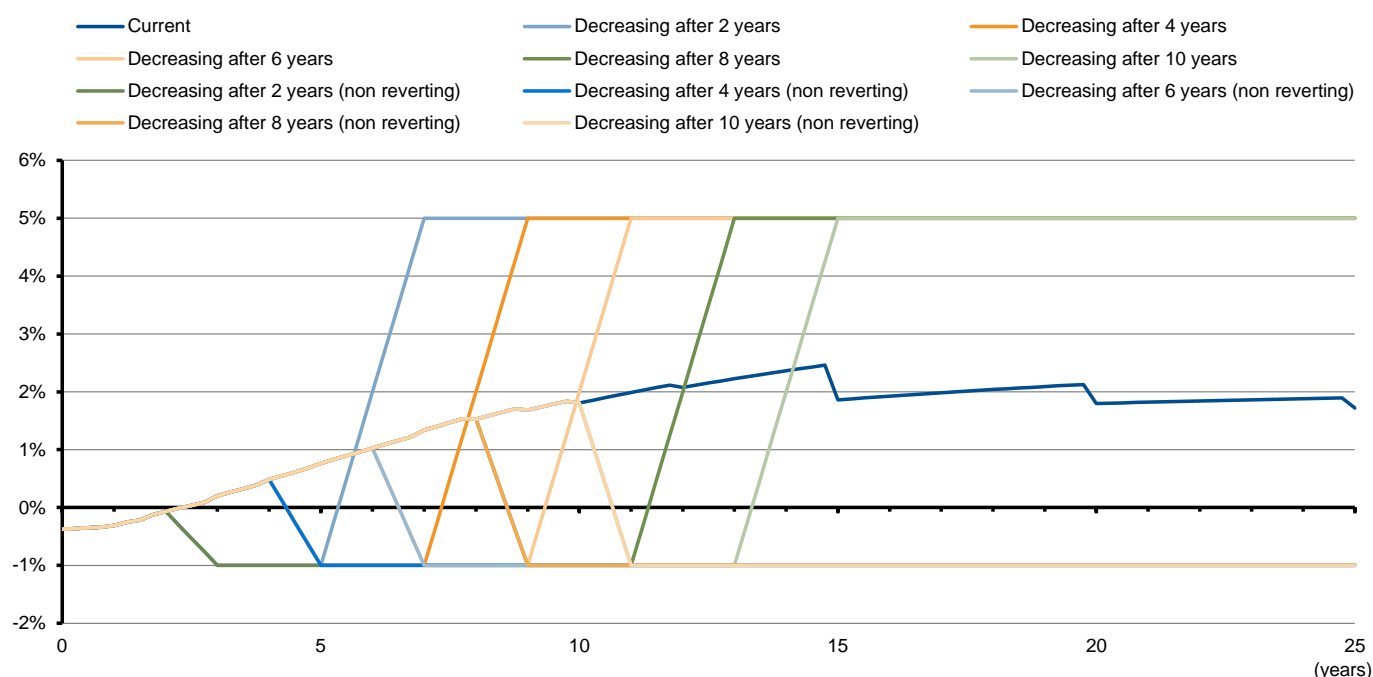
We complement these interest-rate developments with 'lower for longer' and 'higher for longer' scenarios in which the interest rate remains at respectively negative 1% or positive 10% until the pool has matured. We also test against a scenario that gradually rises to 15% (including a spike of up to 20% for a short period), after which rates revert to a long-term mean assumption.

Figure 8: Rising interest-rate forward curves



²⁷ See Appendix VIII: Rating-distance dependent stresses

Figure 9: Decreasing and lower-for-longer interest rate forward curves



2. Foreign-exchange rate risk assessment

We test the resilience of the covered bond programme against adverse exchange rate movements based on historical observations over long periods (up to 50 years). We may use a shorter time series if we observe economic or institutional structural breaks. For the relevant currency pairs, we calculate the highest relative appreciations and depreciations observed for horizons of up to 60 months on a rolling basis, which determine our currency stress for the respective risk horizon.

Starting with the exchange rate as of the reporting period, we deterministically appreciate or depreciate the currency pair until year five, after which we keep the stresses constant. We use extreme scenarios to test the programme's resilience against a strong, sudden increase or decrease in rates over the life of the programme. Depending on the composition of foreign-currency assets or liabilities, we test the cover pool's resilience against either a rise or fall in the relevant currency.

3. Assessing the impact of asset sale

We assume that projected liquidity shortfalls can be covered by asset sales. The amount of asset sales needed is determined by calculating the NPV of a cover pool's projected performing cash flows $CF(t)$, which we convert into the base currency with a projected exchange rate $r_{FX}(t)$ when applicable. We establish the relevant discount factors using the scenario-specific discount curve, to which we add a cover pool-specific liquidity premium (see section 4. below).

We construct the scenario-specific discount curve with simple compounding using the day-zero expected forward curve. The calculation of the NPV at period k with a compounding interval $\Delta(t_j)$ is shown in Figure 10.

Figure 10: Net present value of the cover pool

$$\sum_{i>k} \prod_{j=k}^{i-1} \frac{1}{1 + r_{forward}(t_j)\Delta(t_j)} r_{FX}(t_i) CF(t_i)$$

We apply interest rate stresses consistently by shifting the discount curve in parallel so that the day-zero forward rate of the discount curve matches the corresponding forward rate $r_{forward}(t_k)$.

4. Incorporating asset liquidity premiums into the impact analysis of asset sales

The asset liquidity premiums we add to the interest rate discount curve reflect the different risk perceptions among investors for a given asset type as well as the differences in fungibility and market depth. Generally, the lower the asset pool granularity and the lower the turnover for an asset type, the higher the liquidity premiums. The discount rates also reflect country-specific elements and systemic importance considerations. The liquidity premium used for discounting cash flows therefore reflects the spreads specific to the issuer's country and covered bond type. Figure 11 and Figure 12 show our general assumptions for asset-specific liquidity premiums.

The assumptions may deviate from the below guidelines if, for example, we observe not common cover assets (e.g. banks), very significant liquidity shortfalls (e.g. unbalanced newly established covered bond programmes) or a covered bond programme in winddown would need to resort to repeated asset sales over a long period (e.g. as currently typical for most Spanish covered bond programmes).

When modelling asset sales, we assume unbiased asset selection. This means that the assets selected for a sale are proportionate to the share of each segment at the time of the sale. The cover pool-specific liquidity premium therefore reflects the different refinancing spreads of the respective cover pool segments, their individual amortisation profile, and the timing of the asset sale.

4.1. Public sector liquidity premiums

We determine the public sector asset premiums by analysing the stressed credit spreads (iborxx), or the five or 10-year credit default swap spreads specific to the country and/or public sector obligor. The observation period typically covers the recent sovereign crisis, which affected most sovereigns, as well as periods during which idiosyncratic or geopolitical events put pressure on trading spreads. We also account for the observed volatility of trading spreads, which often indicates secondary-market liquidity. The grouping of countries and asset types reflects our general view on the sovereign's credit quality and lower-tier public sector exposures, including the relevant guarantee structures.

Figure 11: Indicative maximum liquidity premiums for public sector exposures

Group	Countries	Tier 1: sovereign	Tier 2: sub-sovereign	Tier 3: lower-tier sub-sovereign	Tier 4: public sector corporates (guaranteed)	Public sector covered bonds	Public sector with guarantee of sub-sovereign
1	Germany, Finland, Sweden, Norway, Switzerland, US	100	150	200	250	150	150
2	Netherlands, Japan, Canada, multinational	150	200	250	300		
3	Austria, France,	200	250	250	300	200	250
4	Belgium, Eastern Europe (Poland)	300	350				
5	Italy, Iceland	500	550	600			
6	Hungary, Spain	600	650				
7	Non-investment grade countries	1,200	1,250		1,250		

In general, a higher premium indicates that the market for the exposure is lower-tier, smaller and less liquid. With the sovereign premium as the anchor, we generally add 50 basis points for lower-tier public sector exposures and differentiate between the sovereign (tier 1), federal states, departements and regions (tier 2), municipalities, regional and inter-departmental organisations (tier 3), and municipal- or regional-guaranteed corporations (tier 4). For example, the liquidity premium for a group 1 municipality-guaranteed utility (tier 4) is generally 250bps. This is derived by adding the group-specific sovereign premium – 100bps for tier 1 – to their respective tiers, 50bps (tier 2) + 50bps (tier 3) + 50bps (tier 4).

The weighted average pool-specific liquidity premium, which is based on the current pool composition, is added to the discount curve. We apply this liquidity premium through the lifetime of the covered bond structure, scaling linearly between the current premium (D_0) and the spreads commensurate with the relevant rating distance.

4.2. Mortgage asset liquidity premiums

Our approach for mortgage cover assets is similar. For example, our reference point for plain vanilla residential mortgages is the development of country-specific trading spreads (e.g. Iboxx indices) for mortgage-covered bonds comprising the same asset type. If a mortgage cover pool's composition tends towards a specific product (e.g. residential vs commercial) or customer (owners vs buy-to-let), we base our assumptions on the development of trading spreads for market-placed securitisation transactions or indices with similar asset types. For example, we often analyse small-ticket commercial mortgage exposures based on secondary-market trading spreads of the highest-rated tranches of SME transactions.

Figure 12: Indicative maximum liquidity premiums for mortgage assets in cover pools

Collateral type	Residential mortgages		Commercial mortgages	
	From	To	From	To
Austria	150	250	300	500
Belgium	150	250	300	500
Denmark	100	200	300	500
Finland	100	200	300	500
France	150	250	300	500
Germany	100	200	300	500
Italy	200	400	300	700
Netherlands	100	200	300	500
Norway	100	200	300	500
Poland	400	700	400	800
Portugal	500	800	600	1,000
Spain	250	450	300	700
Sweden	100	200	300	500

We apply a fixed liquidity premium over the life of the covered bonds. As we do not expect the stressed economic environment to persist until the last covered bond matures, we generally do not use the highest-observed trading spreads. Cover pool-specific adjustments may also reflect the time during which a cover pool depends on asset sales. We believe a more moderate stress can be applied through the transaction's remaining life if a cover pool has an ongoing need for asset sales over an extended period (generally more than five years)²⁸. We calibrate the premiums to allow for a stressed fire sale that provides the cover pool manager enough time to set up an orderly sale that maximises mortgage loan values.

5. Overcollateralisation

Higher levels of overcollateralisation provide better protection for investors in cases of insolvency. Our methodology aims to avoid the rating volatility caused by an issuer's adverse management of available overcollateralisation. The issuer's ability and willingness to provide such overcollateralisation therefore plays a key role.

We account for available overcollateralisation for issuers rated at least BBB as they are incentivised to ensure predictable management of overcollateralisation. However, if overcollateralisation volatility is close to the level needed to support the current rating and the issuer does not provide a publicly committed guidance, we will use a stressed low-point overcollateralisation based on prior-year trends. As all covered bonds rank pari-passu with each other, adverse management of overcollateralisation would not only impact the rating of new issuances, but also the ratings of existing covered bonds of the same type.

²⁸ A wind-down of a cover pool might take 20-30 years, and weak economic environments, during which the highest trading spreads can be observed, often have not persisted for such long periods.

Without contractual commitments, an issuer is more likely to negatively manage overcollateralisation if its rating falls below BBB²⁹.

We also account for available overcollateralisation if the issuer's communication on overcollateralisation to the capital markets is robust and in line with market expectations. Generally, capital market communication should become more assertive and include more dynamic elements as the bank rating falls, as well as describe a predefined withdrawal process as a minimum period before the issuer reduces overcollateralisation. In the absence of such statements, we will for our rating analysis adjust down the level of overcollateralisation taken into account. Further, we reflect observed volatility and our forward-looking view on expected overcollateralisation.

We consider the legal minimum overcollateralisation for issuers rated BB or below if they have made no public contractual commitments. Commitments need to be legally binding to ensure an issuer does not act to the detriment of investors. Contractual provisions that partially or collectively allow us to recognise higher overcollateralisation than the regulatory minimum, thus allowing a higher rating uplift, include: i) detailed programme-specific replenishment criteria; ii) structures that reduce refinancing risk (e.g. conditional pass-through structures); and iii) provisions ensuring a dynamic level of overcollateralisation that is commensurate with the risk profile and the rating in question. Such provisions would have to be provided contractually and permanently.

6. Other cash flow assumptions

Prepayment rate assumption

The covered bond structure's resilience is tested against constant prepayment rate (CPR) assumptions. Covered bond structures are often most sensitive to very low prepayment assumptions. We use a conservative 1% assumption as the base scenario. Higher prepayment assumptions generally benefit the cover pool analysis as they increase cash accumulation, reducing the need for the issuer to monetise parts of such pools. We also test the covered bond programme's risk profiles against higher prepayment rates. A high CPR assumption is typically 15%, or we take the market rate if this is significantly higher. We may change our approach if a specific asset type, certain macroeconomic expectations (e.g. changes to interest rates), or changes to the loan products make it more or less costly to prepay.

Reinvestment risk

We assumed proceeds that are not needed to pay interest or repay maturing covered bonds can be invested at short-term market rates. As cash proceeds must be readily available and likely invested in highly liquid and high-credit-quality assets, we also apply a stress on the short-term market rates.

We will also identify the sensitivity towards investments that yield more than market rate if cash proceeds are sizeable, available for long periods and the programme documentation or legal framework allows re-investment into higher-yielding and longer-dated 'eligible assets'.

Servicing fee

We apply servicing fees specific to the country and asset type that the cover pool has to pay annually: 10 bps for a pool of less complex public sector cover assets and higher fees for mortgage assets, e.g. 25 bps for the residential segment and 50 bps for the commercial segment (including developers and land). We may lower the servicing fee for very large cover pools that benefit from economies of scale (typically above EUR 10bn) or increase the servicing fee for more complex cover pools (e.g. cover pools with significant shares of export credit agency-guaranteed exposures).

Other considerations

When inputs for the cash flow analysis are not contractually specified, our analysis incorporates them as variables based on our qualitative assessment.

²⁹ Rating-sensitive capital market funding might no longer be economically feasible for lower-rated issuers; they could instead turn to collateralised central bank funding. The maintenance of minimum rating thresholds that allow for central bank access using covered bonds might result in lower overcollateralisation than that needed to support ratings that facilitate direct capital market access.

7. Liquidity provisions after issuer default

Improved regulatory frameworks, the introduction of resolution regimes, and increased and more proactive supervision have significantly reduced the 'jump to default' risk for banks. Combined with the special regulatory treatment for covered bonds, mismatch risk in a covered bond programme is unlikely to directly translate into liquidity-driven default risk after an issuer has been designated as non-resolvable and put into liquidation.

Short-term liquidity risk is generally relevant when cover pool support enhances the covered bond rating above fundamental credit support factors. We generally expect covered bonds from non-investment grade issuers to benefit from additional liquidity protection that helps against payment disruptions after issuer default. Our analysis reflects the relevance of mismatches, as well as mandatory or contractual liquidity protection mechanisms³⁰ and the periods these cover. Our assessment of the underlying cover assets' liquidity helps us to determine whether all or just part of the cover pool support uplift should be granted.

For resolvable banks, the liquidity assessment of the issuer, which reflects its ability to repay covered bonds on time, will address the fact that a bank in resolution needs to remain liquid and will benefit from access to central bank liquidity if it is solvent. For non-resolvable banks, our liquidity assessment of the issuer and the covered-bond-specific mitigants will be performed as part of the cover pool support and cash flow risk analyses.

³⁰ Either allowing for maturity extensions or the provision of liquid assets.

Appendix VI: Determining the expected loss

The calculation of loss rates of the cash flow structure for a given default distribution allows us to calculate the expected loss and expected average life of the covered bond structure. Along with our idealised expected loss curves³¹, this allows us to determine the covered bond's rating under the given scenario.

The cash flow simulation addresses all default scenarios (ω_i) occurring with probability $p(\omega_i)$ to calculate the respective loss $L(\omega_i)$. The expected loss is then calculated as the probability-weighted sum $\sum_i p(\omega_i)L(\omega_i)$. Only a subset of these scenarios is relevant because the bank, as long as it has not defaulted, will shield the cover pool from losses.

Aggregating the scenarios that include a bank default scenario $\bar{\omega}$ we have:

Figure 13: Expected loss of a covered bond

$$\sum_i p(\omega_i \wedge \bar{\omega})L(\omega_i) = \sum_i p(\omega_i)p(\bar{\omega}|\omega_i)L(\omega_i) = \sum_i p(\omega_i)\tilde{L}(\omega_i).$$

The conditional probability $p(\bar{\omega}|\omega_i)$ depends on the dependency (correlation) between default scenarios and bank default events. In general, cover pool assets are similar to the bank's assets in terms of composition and therefore are highly correlated. For example, bank default is more likely if we observe high default rates in the pool. This is also consistent with a worst-case selection approach.

The total unconditional probability of a bank default $p(\bar{\omega})$ – in other words, the probability of the event leading to the detachment of the pool from the bank – needs to be defined externally. We establish the detachment point using our probability default curves, taking into account the issuer rating and the weighted average life of the outstanding covered bonds (unstressed).

The threshold default rate dr_T is defined so that the probability of default rates that exceed the threshold rate equate to the bank's default probability or its equivalent $p(dr < dr_T) = 1 - p(\bar{\omega})$. Under the protection of the bank, we then calculate the expected loss as the probability-weighted sum over all default scenarios with a default rate greater than the threshold default rate dr_T .

For further information on the implementation see Appendix VII: Scope's covered bond expected loss model (CobEL).

³¹ Scope's expected loss tables are available at www.scoratings.com under Definitions & Scales under the Governance and Policies tab.

Appendix VII: Scope's covered bond expected loss model (CobEL)

Our CobEL model implements the calculation of a covered bond's expected loss as described in the previous appendix. The expected loss is determined via a numerical integration of the losses under different default rate scenarios, weighted with their respective probability. The algorithm naturally separates into a cash-generating part and a cash-consuming part – each will be described below.

Asset treatment

The model assumes the asset pool is perfectly granular and homogeneous. Assets will generate future cash flows according to assumptions for interest, amortisation payments, prepayments, defaults, recoveries, asset cures along with other market parameters such as foreign-exchange and interest rates. Asset assumptions are specific to the covered bond and recorded as vectors.

We simulate cover pool assets as either performing, delinquent or defaulted. Performing assets pay interest and amortise according to a specified schedule. We exclude defaulted mortgage assets from the asset balance and the assumed recovery will be distributed over time according to a defined recovery schedule. Defaulted public sector or substitute assets are also excluded from the asset balance. However, assets are reinstated following their workout period but are proportionally reduced with the assumed recovery rate.

Assets normally do not change directly from performing status to default; rather, they undergo a period of delinquency. Delinquent assets can fully or partially cure before defaulting. We generally assume a level of liquidity stress by considering that a percentage of assets may become delinquent and cure, i.e. become performing again and pay previously missed payments after a moratorium period, before defaulting.

The performing asset balance for each currency and in each period undergoes the following sequence:

1. Add back cures or recoveries to the opening performing mortgage asset balance
2. Reinstatement of public sector or substitute assets at the assumed recovery rate for such assets
3. Subtract new delinquent assets from the opening performing balance
4. Calculate interest specific to the asset type over the period based on the resulting performing asset (steps 1 to 3) and cash balances
5. Subtract prepayments over the period
6. Subtract amortisation over the period
7. Remove sold assets from the performing balance

By default, each period corresponds to a calendar month except if the transaction's time-related characteristics need adjustment.

Liability treatment

Our CobEL model has a very flexible description of the priorities of payment for the different covered bond structures. The model features a set of accounts that keeps track of the outstanding liabilities and cash inflows and outflows. The model enables the analysis of not only hard- and soft-bullet covered bonds but also securitisation-like pass-through structures (CPTs).

The available cash is used to pay interest and servicing fees and repay maturing covered bonds. The bonds are paid pro-rata. For multi-currency pools, we convert cash flows into the corresponding foreign-exchange rate at the time of the event. If cash is insufficient to repay principal, interest or expenses, assets are sold based on the present value at the simulation time and considering additional discounts to facilitate timely payment. We reflect the asset sale by proportionally reducing the performing asset balance.

Other functionalities

CobEL allows us to systematically identify and apply the interest-rate and foreign-exchange stress scenarios to which the covered bonds are most sensitive. The model creates the stress scenarios as described in the methodology using a generic distortion parameterisation of the input curves.

The model also calculates the required breakeven overcollateralisation for a given rating by applying a line search algorithm, performing a full re-calculation for each parameter change.

Appendix VIII: Rating-distance dependent stresses

To quantify the credit benefits provided by the cover pool, we analyse the cover pool for resilience against increasing stresses. The severity of the stresses depends on the distance between the potential covered bond rating and the bank rating. We establish a base case stress that identifies the level of risk in the covered bond programme that is covered by the issuer. The analysis assumes the base case credit losses, current market conditions regarding interest and currency rate developments, and no additional liquidity premiums for asset sales. The highest achievable rating distance, D_{\max} , could be as high as nine notches (equating to a D_9 scenario). Generally, we anchor the highest stresses at levels commensurate with a AAA rating. Iteratively increasing the stress scenarios provides insight into the covered bond programme's resilience to adverse credit environments. We benchmark the quantitative results of the scenario analysis against our expected loss tables.

Example 1: Testing the cover pool's resilience to a level supporting the full rating distance

Assumptions: Issuer rating at BBB- ($= D_0$); fundamental credit support at six notches; maximum cover pool uplift at nine notches ($D_{\max} = D_9$ = six-notch fundamental support uplift + three-notch cover pool uplift); nine-notch rating distance between issuer rating and AAA rating

To analyse whether the cover pool can fully support the rating uplift, we apply stresses commensurate with the highest rating uplift (D_{\max}). In this case, the most severe credit and market risk stresses are equivalent to a D_9 stress³². The CobEL model helps with determining the expected loss of the covered bond programme. If the expected loss for a given level of overcollateralisation is equal to or lower than the idealised expected loss at AAA³³, the scenario test has been passed and the suggested nine-notch credit differentiation is quantitatively supported.

Example 2: Testing the cover pool's resilience to a level lower than the full rating distance

Assumption: Issuer rating at BBB- ($= D_0$); fundamental credit support at six notches; maximum cover pool uplift at nine notches ($D_{\max} = D_9$ = six-notch fundamental support uplift + three-notch cover pool uplift); seven-notch rating distance between issuer rating and AAA rating

The same maximum uplift as in example 1 is possible (D_{\max} = nine notches) but the issuer rating is higher. The rating distance to the highest possible rating (AAA) only requires an uplift of seven notches, however³⁴.

We determine the rating-supporting overcollateralisation by testing the cover pool's resilience against a scenario in which the maximum uplift is anchored at a stress commensurate with seven notches, corresponding to a D_7 stress (with D_7 equating to seven-ninths of the maximum stresses).

In this example, the highest rating is achieved but stresses are milder than expected for the rating. Further, only applying milder stresses could result in significant changes in the rating-supporting overcollateralisation. A downgrade of the issuer and its inability to provide additional overcollateralisation could result in a higher-than-expected rating volatility. As such, we perform an additional analysis to determine the rating-supporting overcollateralisation, calculated as the difference between a D_9 stress and the overcollateralisation needed to mitigate a D_2 stress (i.e. equating to two-ninths of the maximum stress).

We follow the same rationale to test additional sensitivities against an issuer rating change, i.e. by assuming a one-notch issuer downgrade and upgrade.

Example 3: Testing the cover pool's resilience if the maximum distance is constrained by fundamental uplift

Assumption: Issuer rating at BBB+ ($= D_0$); fundamental credit support at four notches; maximum cover pool uplift at seven notches ($D_{\max} = D_7$ = four-notch fundamental support uplift + three-notch cover pool uplift); seven-notch rating distance between issuer rating and AAA rating

The maximum rating distance is seven notches, only achievable if the cover pool can mitigate the highest stresses ($D_{\max} = D_7$). The degree of stress is linearly interpolated between the prevailing interest rate (D_0) and the maximum stressed interest rate (D_7). The highest rating can be achieved if available overcollateralisation can mitigate the highest stresses. If overcollateralisation is insufficient, we will reduce the intensity of stress (D_6 stress, equating to six-sevenths of the maximum stress) and test whether the lower rating can be supported. We will also calculate the complementary rating-supporting overcollateralisation as explained in example 2.

Example 4: Testing the cover pool's resilience if the maximum distance is constrained by cover pool uplift

Assumption: Issuer rating at BBB+ ($= D_0$); fundamental credit support at five notches; additional cover pool uplift capped at two notches due to data limitations; maximum cover pool uplift at seven notches ($D_{\max} = D_7$ = five-notch fundamental support uplift + two-notch cover pool uplift); seven-notch rating distance between issuer rating and AAA rating

The maximum rating distance is seven notches, achievable only if the cover pool can mitigate the highest stresses ($D_{\max} = D_7$). The degree of stress is linearly interpolated between the prevailing interest rate (D_0) and the maximum stressed interest rate (D_7). The highest rating can be assigned if available overcollateralisation can mitigate the highest stresses. If overcollateralisation is insufficient, we will reduce the intensity of stress (D_6 stress, equating to six-sevenths of the maximum stress) and test whether the lower rating can be supported. We will also calculate the complementary rating-supporting overcollateralisation as explained in example 2.

³² Stress scenarios for rating differentiations between the bank and the maximum achievable covered bond rating are determined by a linear interpolation.

³³ See Scope's expected loss tables available on www.scooperatings.com. The benchmark is taken from the intersection of the target rating (here: AAA) and the weighted average maturity of outstanding covered bonds.

³⁴ One additional notch of cover pool support already allows the highest rating to be achieved. If sufficient overcollateralisation is available, cover pool support allows the current rating to be maintained upon an issuer downgrade of up to two additional notches, providing additional rating stability. We often refer to the remaining, currently not needed support as 'unused notches' or the 'rating buffer'

Appendix IX: Impact of cover pool information quality on maximum cover pool support uplift

For covered bonds issued under a strong legal framework and that comply with transparency requirements set by regulation and the industry, information is sufficient for a cover pool analysis. Our credit risk analysis generally considers the issuer's underwriting expertise and issuer performance data. In the absence of issuer-specific information, our base case assumptions take recourse to comparable market information, e.g. asset or collateral risk assumptions in structured finance methodologies for similar asset classes, or market data. Our assumptions aim to incorporate credit performance data over long periods that include past credit crises.

We would not grant an additional cover pool support uplift if, for example, information on key risk factors is no longer available, the covered bond programme is very small and unbalanced, the cover pool is highly bespoke and concentrated, and issuance terms and conditions are bespoke and include material market risk features. We may even withdraw the covered bond rating if the cover pool analysis excessively relies on comparable information and/or the level of transparency materially changes during the monitoring review.

Additionally, complexity and transparency can differ significantly between covered bond programmes. Balancing these two variables, we score the covered bond programmes in terms of the potential additional uplift their cover pools can support. The covered bond programme with the best transparency can support the maximum three-notch uplift. The interplay of complexity and transparency reduces the potential additional cover pool-based uplift.

Figure 14: Cover pool complexity (CPC) score

CPC score	Maximum potential (additional) cover pool uplift	Applicability and expected information quality
1	Plus three notches	Applicable to all covered bond programmes where the following conditions are present: Ongoing availability of detailed, regular, current and forward-looking transparency on key credit and market risk factors; information on lending products; ability to assess the issuers underwriting and credit risk procedures; high visibility on origination and issuance strategy; full access to all relevant counterparty risk information.
2	Plus two notches	Applicable for low-complexity programmes where the following conditions are present: granularity of cover assets; loan and collateral terms are common in the market; a balanced covered bond maturity structure results in a diversified cash flow profile. We expect the issuer to publicly provide on a quarterly basis information on current key risk factors for the respective covered bond programme using industry best practice reporting templates, preferably supplemented with additional credit risk information in its annual reports; information typically expected for a CPC score of 1 can be substituted with comparable market information.
3	Plus one notch	Applicable for covered bond programmes with common cover assets where typically at least one of the following conditions is present: high concentration risk as typically seen in commercial mortgage or public finance pools; noticeable foreign-exchange or interest rate risk; limited transparency on hedging strategy and counterparty risk mitigation. The constrain would apply if information on current key risk factors is only provided through industry best practice templates and annual reports as per above.
4	No additional cover pool uplift	Applicable for covered bond programmes where at least one of the following conditions is present: covered bond programme is no longer actively managed and/or in wind-down; contains very bespoke, low granularity and illiquid cover assets (i.e. ship or aircraft loans); comprises cover assets with unusual structures (i.e. inflation/market links or reverse mortgages); exhibits material foreign-exchange exposure, and/or the issuer provides information less frequent than quarterly, only irregularly and/or typically only provides the regulatory minimum transparency on key risk drivers. The constraints could become mitigated if access to information is similar to CPC Category I programmes allowing for an ongoing assessment of an effective risk mitigation.

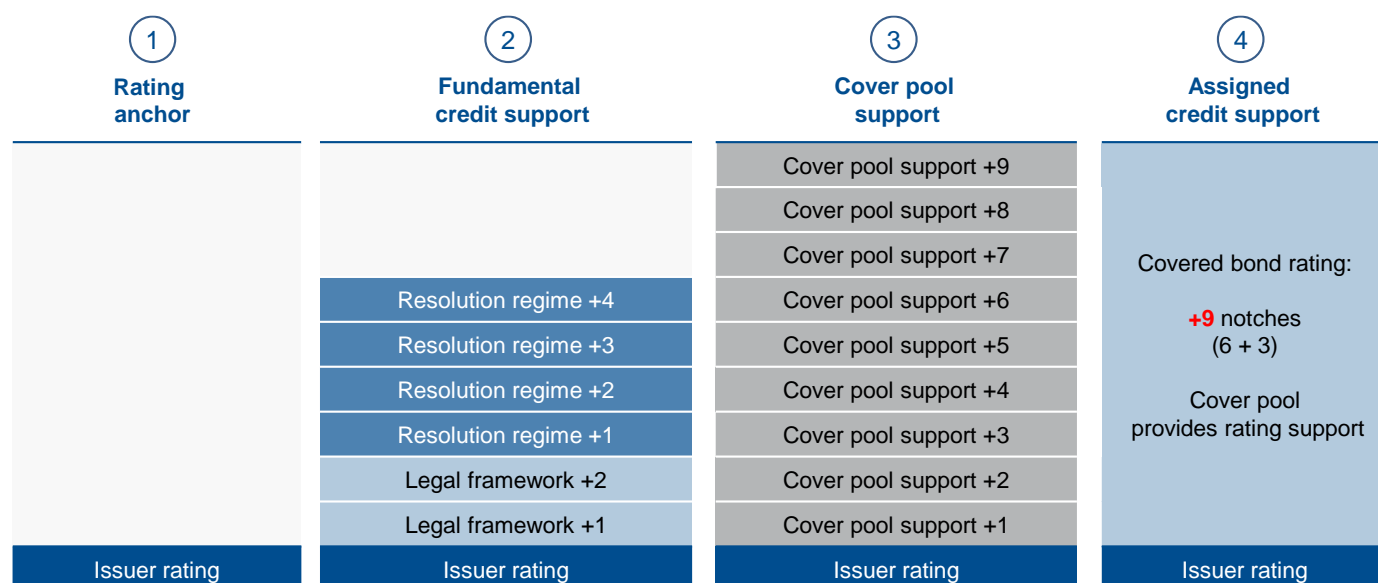
Appendix X: Credit differentiation supported by cover pool assessment – worked examples

The covered bond rating methodology rests on two analytical building blocks. The first block, the fundamental credit support analysis, comprises the analyses of the legal framework, resolution regime and systemic importance. The second consists of the cover pool support analysis. The final credit differentiation between the bank rating and the covered bond rating is based on the higher support provided by either of the two. To illustrate, we provide examples on the impact of the primary rating driver for the assigned ratings.

Cover pool-supported covered bond ratings

In this example, the fundamental credit support analysis provides a credit differentiation of six notches and the interplay of the covered bond programme's complexity and transparency yields a CPC score of 1. This allows a potential additional credit differentiation of up to three notches, with the cover pool support analysis confirming the covered bond programme's strength. Therefore, the cover pool-supported rating can be nine notches above the issuer rating (Figure 14).

Figure 14: Covered bond rating – maximum uplift supported by the cover pool



Source: Scope Ratings

When cover pool protection can only support a two-notch uplift (Figure 15) as opposed to the maximum three notches, we would assign the lower rating uplift.

Figure 15: Covered bond rating – cover pool provides uplift but not the maximum due to overcollateralisation constraint

① Rating anchor	② Fundamental credit support	③ Cover pool support	④ Assigned credit support
		Cover pool not strong enough to provide further uplift (maximum would be +9)	
		Cover pool support +7	
		Cover pool support +6	
		Cover pool support +5	
		Cover pool support +4	
		Cover pool support +3	
		Cover pool support +2	
		Cover pool support +1	
Issuer rating	Issuer rating	Issuer rating	Issuer rating
	Resolution regime +4		
	Resolution regime +3		
	Resolution regime +2		
	Resolution regime +1		
	Legal framework +2		
	Legal framework +1		
			Covered bond rating: +7 notches (6 + 1) Cover pool provides rating support

Source: Scope Ratings

In this example, the issuer maintains a low complexity covered bond programme. Our auxiliary credit considerations confirms that expectations for a covered bond programme with a CPC score of 2 are fully met. These expectations include a well-seasoned residential mortgage pool; fixed-rate-paying cover assets refinanced with fixed-rate covered bonds; and quarterly transparent information that fully aligns with industry standards such as the ECBC's Harmonised Transparency Template. Here, the cover pool analysis can support a maximum uplift of two additional notches, adding to a total of eight notches (Figure 16).

Figure 16: Covered bond rating – cover pool provides uplift but not the maximum due to lower CPC score

① Rating anchor	② Fundamental credit support	③ Cover pool support	④ Assigned credit support
		Limited availability of information constrains cover pool support to 8 notches (maximum would be +9)	
		Cover pool support +8	
		Cover pool support +7	
		Cover pool support +6	
		Cover pool support +5	
		Cover pool support +4	
		Cover pool support +3	
		Cover pool support +2	
		Cover pool support +1	
Issuer rating	Issuer rating	Issuer rating	Issuer rating
	Resolution regime +4		
	Resolution regime +3		
	Resolution regime +2		
	Resolution regime +1		
	Legal framework +2		
	Legal framework +1		
			Covered bond rating: +8 notches (6 + 2) Cover pool provides rating support

Fundamental credit support-based covered bond ratings

The credit quality of concentrated cover pools, or covered bond cash flow structures that are unbalanced or insufficiently supported by overcollateralisation, might not allow a high uplift. Similarly, excessive counterparty risk could reduce the support provided by the cover pool support analysis. Cover pool support could therefore be lower than the benefit provided by fundamental support. In this case, the covered bond rating will primarily reflect fundamental credit support. Figure 17 provides an example of a covered bond rating that primarily reflects fundamental credit support of six notches.

Figure 17 Covered bond rating – cover pool provides uplift but not as high as fundamental credit support

① Rating anchor	② Fundamental credit support	③ Cover pool support	④ Assigned credit support
		Cover pool not strong enough to provide further uplift	
		Rating floor at fundamental support	
	Resolution regime +4		
	Resolution regime +3		
	Resolution regime +2	Cover pool support +4	
	Resolution regime +1	Cover pool support +3	
	Legal framework +2	Cover pool support +2	
	Legal framework +1	Cover pool support +1	
Issuer rating	Issuer rating	Issuer rating	Issuer rating Covered bond rating: +6 notches Fundamental aspects provide credit support

Source: Scope Ratings

Appendix XI: ESG impact analysis

Governance considerations such as strength of supervision as well as the prudent management of a covered bond programme's risk³⁵ and protection³⁶ structure have always played a major role in the covered bond analysis. They are reflected both in the fundamental but also in the cover pool support analysis.

This update also introduces as an additional governance factor the issuers management of the interplay of complexity and the level of transparency provided to investors³⁷. Both, the management of protection and adequate transparency are key rating drivers and can significantly constrain or even prohibit the inclusion of additional, cover pool supported rating uplift into the covered bond rating³⁸.

The impact of environmental and social factors on a covered bond's collateral are also increasingly important for the credit analysis. Today, green and social covered bonds are an integral and growing feature of the wider ESG issuance universe. Cover assets often already comply with environmental and social standards³⁹ and, if i.e. detailed environmental data such as energy certificates are not yet available, 'use of proceeds' promises can introduce or further increase the share of compliant assets in the cover pools over time.

Asset credit risk and secondary-market liquidity have ESG aspects that impact the covered bond credit analysis. Buildings, the most common collateral in covered bonds, account for 40% of global primary-energy consumption and 30% of CO₂ emissions. The EU's energy savings target will further increase the share of 'green' mortgage collateral. Over time, compliant collateral may benefit from lower market value volatility because of the stronger backstop against value declines.

Borrowers that finance eligible ESG collateral could benefit from higher affordability and thus a lower likelihood of defaults. This might be prompted by lower debt servicing costs due to more benign risk-weights for ESG compliant collateral but also because of lower energy bills.

Vice versa, foreclosure proceeds from non-green collateral might become more volatile due to rising energy costs, higher fossil fuel prices and the prospect of carbon regulation – all of which might force potential buyers to factor in additional refurbishing costs, thereby lowering potential foreclosure proceeds. The assets may even become 'stranded', which would have a severe impact on foreclosure proceeds and thus become relevant for the assessment of asset credit risk.

Our asset credit risk analysis is non-mechanistic and uses available performance data. We therefore monitor developments such as the ECBC's Energy Efficient Mortgage Initiative or academic research that examines how ESG factors affect a borrower's probability of default, collateral value and, thus, loss given default. We will incorporate available issuer-specific or market information that robustly supports differences in asset-credit risk between ESG-compliant assets and other assets in the cover pool.

Missing performance information (ESG data was often not recorded in the past) as well as the absence of a common taxonomy between countries currently prevents our credit analysis from distinguishing between standard collateral and ESG-compliant collateral. Even more so, incorporating such information might become a zero-sum game: High energy-efficiency is already mandatory in most markets (particularly in Scandinavia) and observed credit performance already reflects the likely benefits. Unless non-compliant cover assets are penalised (for example, through changes to tax regimes), we do not expect a significant impact in our current credit risk assessment from ESG factors. Splitting the two can thus be rating-neutral.

The more likely credit impact is the beneficial increase in the secondary-market liquidity of eligible assets. Regulatory developments already stipulate the disclosure or even a minimum investment in environmental or sustainable bonds. Sizeable portions of ESG-compliant collateral in a cover pool will therefore likely attract stronger demand and a wider investor base. If potential buyers can refinance such assets at a lower cost, our assessment can incorporate this in a cover pool's liquidity premium. To date, however, there is no firm evidence of such spread differentiation between traditional and social/green covered bonds.

³⁵ Including but not limited to the identification and origination of suitable cover assets (including their workout strategy if the borrower has defaulted), the pool composition as well as the issuance structure and the resulting cash flow risk structure

³⁶ The most actively managed risk mitigation that also qualifies as a governance factor is the management of the supporting overcollateralisation, see section 5. Overcollateralisation in Appendix V: Cash flow risk analysis

³⁷ See Appendix IX: Impact of cover pool information quality on maximum cover pool support uplift

³⁸ See Figure 17 in Appendix X: Credit differentiation supported by cover pool assessment – worked examples

³⁹ Such as the ICMA's [Green, Social, Sustainable Bond Principles](#) or similar industry initiatives.

Appendix XII: Country risk considerations

We do not mechanistically limit the maximum rating that a covered bond can achieve by the sovereign rating of the issuer's country or the origin of the cover pool, particularly in eurozone countries. At the same time, credit ratings must adequately and consistently reflect the credit risks of a financial instrument, including risks arising from an issuer or collateral in a country with weak economic fundamentals. Where relevant, our ratings therefore also incorporate an assessment of transfer risk (e.g. risk of capital controls), convertibility risk (e.g. risk of eurozone exit), the risk of an institutional meltdown, and the impact on the covered bond rating.

On a case-by-case basis, we analyse the impact of country risks and its resulting influence on guarantee structures, transfer and convertibility risks, including legal certainty of the rule of law for covered bond ratings. Where relevant, we ensure that our view on the macroeconomic fundamentals of the relevant sovereign⁴⁰ are factored into the stresses that support the covered bond ratings.

The importance of country risk may differ between covered bond and bank rating analyses as the cover pool's composition and risk profile are likely to exhibit different risk characteristics from the rest of the issuer's balance sheet. The relative significance of country considerations may also vary among issuers to the extent that the compositions of cover pools vary.

⁴⁰ We consider the economy of the country to which most of the cover assets are sensitive. In general, we expect this to be the country in which the issuer is located.

Appendix XIII: Counterparty risk considerations

Our assessment of the dependency on key counterparties and how this can impact the cover pool analysis is based on our methodology for counterparty risk in structured finance transactions (available on www.scoperatings.com). The guiding principles are the materiality of counterparty risk (excessive, material or immaterial), differentiation between financial risk and operational risk, and the analysis of risk remedies in the specific context of the covered bond transactions.

We analyse whether the performance and creditworthiness of a covered bond could be severely impacted by the inadequate short- or long-term credit strength of such external counterparties. This could constrain the potential benefit from the cover pool. An effective replacement framework or other mechanisms to mitigate structural risk for key agents typically prevent negative impacts. Ineffective remedies result in the quantification of counterparty risk, which can ultimately constrain the benefit from the cover pool for the covered bond rating. This is especially relevant for counterparty obligations that are very significant, bespoke, or are provided by counterparties belonging to the same financial group as the issuer.

However, issuer and investor interests are generally more strongly aligned in covered bond programmes than in structured finance transactions. If the issuer is not in default, the covered bond programme needs to be maintained in line with regulatory requirements. If a counterparty in a covered bond transaction has had its credit quality deteriorate, or has even defaulted, the issuer would need to provide compensation and new proceeds to the cover pool. Therefore, for resolvable banks, the counterparty risk assessment for covered bonds would mainly address rating volatility that may arise from weak or non-performing counterparties.

We expect covered bonds issued by non-resolvable banks or non-investment grade banks to be shielded against counterparty risk in the same way comparable structured finance transactions are. If the provided remedies are ineffective, cannot be sized or residual risk is material, we may link the covered bonds to the respective counterparty's credit risk⁴¹.

⁴¹ In case such a link reduces the cover pool analysis based support below the level indicated by the fundamental credit support, fundamental credit support will become the primary rating driver. (see Appendix X: Credit differentiation supported by cover pool assessment – worked examples)

Appendix XIV: Monitoring guidelines

The covered bond monitoring process starts immediately after the rating is assigned. Ratings are monitored continuously through high-level checks (i.e. based on quarterly reports provided by the issuer) and reviewed in detail at least once a year or earlier if warranted.

The review takes into account the issuer's credit quality, fundamental support factors, and the programme's cover pool risks including credit, market, and counterparty risk factors. It also reflects whether the rating is already at the highest level but has recourse to a rating buffer. This could be the case if a highly rated issuer manages the covered bond programme and the combination of rating uplifts allow a higher uplift.

Double recourse for covered bonds also means that as long as the issuer is not in resolution or insolvent the issuer shields the cover pool against changes of its credit quality. For the cover pool analysis, we may therefore use previously established outputs of quantitative models provided:

- Available overcollateralisation provides a significant buffer to the rating-supporting overcollateralisation. For example, if available overcollateralisation is at least twice the rating-supporting level and the absolute difference is at least 10 pp; and
- The covered bond rating has a rating buffer⁴² against an issuer downgrade and the resulting constraints arising from the covered bond-specific uplift assessment; and
- There have been no material changes in the economic environment that could impact the collateral (i.e. changes to unemployment, GDP, house prices) or in the legal framework relevant for the enforcement of collateral; and
- There have been no changes to the issuer rating or fundamental credit support. and
- Any changes to the composition of the covered bond programme or cash flow structure are immaterial since the last full analysis.

In addition, if changes relate to only a single risk-factor, we may re-run our quantitative models but use parts of the inputs from the previous cover pool analysis. For example, an issuer downgrade by one notch weakens the issuer's ability to shield the cover pool from losses, while increasing the distance between the issuer rating and the target rating. If cover pool-specific risks have remained stable in the meantime, we may re-run our cash flow model using previous cover pool-related model inputs, while only adjusting the lower issuer rating in the model. We perform a full and detailed cover pool analysis every three years at the latest.

⁴² We define a rating buffer or unused notches as the additional protection a covered bond rating has but which cannot be factored in as the highest rating is already achieved. Assuming a Bank rating of A minus, fundamental credit support of six notches and a highly transparent and low complexity covered bond programme, the maximum rating uplift could be nine notches under our methodology. Because of the high issuer rating only six notches are needed to support the highest rating and there is a "buffer" or three unused notches of rating support.

Upon the downgrade of the bank issuer rating to BBB+ from A-, the covered bonds could still maintain their AAA rating assuming i) an unchanged fundamental credit support of six notches and ii) the ability of the cover pooled to support at least one additional notch of cover pool support-based uplift. Upon the downgrade we likely would only update the issuer rating in our cash flow analysis to determine the additional overcollateralisation needed to support the highest covered bond rating.

Appendix XV: Data expectations for cover pool analysis

A cover pool analysis that could result in an additional rating uplift would require the following information:

General information

- a) Nominal value of cover pool
- b) Nominal value of outstanding covered bonds

Cover pool composition

- a) Mortgage
- b) Public sector
- c) Substitute assets
- d) Other

Cash flow risk

Cover pool amortisation profile

- a) Weighted average life; or
 - b) Weighted average remaining term to maturity; or
 - c) Weighted average seasoning
- and
- d) Breakdown by repayment type

Covered bond amortisation profile

- a) Maturity by buckets; or
 - b) List of outstanding covered bonds
- and
- c) Overview of the maturity extension options and triggers

Market risk

Currency risk

- a) Cover assets, breakdown by currency
- b) Covered bonds, breakdown by currency

Interest rate risk

- a) Cover assets, breakdown by interest rate type
- b) Covered bonds, breakdown by interest rate type

Credit risk

Mortgage cover pool

- a) Mortgage type Information
- b) Number of loans and obligors
- c) Breakdown by loan size
- d) Top 10 or 20 obligor concentration
- e) Breakdown by country
- f) Breakdown by region
- g) Breakdown by seasoning buckets
- h) Weighted average loan-to-value ratio
- i) Breakdown by loan-to-value ratio buckets
- j) Non-performing loans

Public sector cover pools

- a) Number of loans and obligors
- b) Breakdown by loan size
- c) Top 10 or 20 obligor concentration
- d) Breakdown by country
- e) Breakdown by region
- f) Breakdown by debtor type
- g) Non-performing loans

For concentrated cover pools (e.g. public sector and predominantly commercial mortgage assets), we would need more information on the cover pool's top 10 obligors, including their individual share and debtor type.

We also expect documentation on the current programme and counterparties to be constantly available, as well as clear and publicly transparent communication on the issuer's hedging strategy, if relevant.

We assess any deviations from the expected information in the context of the cover pool's overall risk and complexity. If we deem the deviation immaterial, we may substitute missing information with assumptions based on expert opinion. See 'Appendix XIV: Impact of Cover Pool Information Quality on Maximum Cover Pool Support Uplift' on how differences between our expectations and the provided information might influence the additional credit differentiation from the cover pool.

Appendix XVI: Glossary

Issuer or bank rating	Anchor point of our covered bond credit assessment reflecting our view on the likelihood of a regulatory action on the issuer, which is the typical default-like scenario for a bank.
Fundamental credit support uplift	Uplift of up to six notches above the bank's issuer rating, reflecting the higher going-concern likelihood of covered bonds, even upon a regulatory intervention in its issuer. Sum of 'legal framework uplift' and 'resolution regime uplift'
Legal framework uplift	Uplift of up to two notches based on the legal framework analysis
Resolution regime uplift	Uplift of up to four notches based on the resolution regime and systemic importance analysis
Covered bond rating floor	Issuer rating plus the fundamental credit support uplift (up to six notches)
Cover pool complexity (CPC) score	A score reflecting the interplay of complexity and transparency of covered bond programmes limiting the potential cover pool support uplift.
Cover pool support uplift	Uplift of up to three notches above the covered bond rating floor based on the cover pool support analysis and the CPC score
Overcollateralisation or OC	Nominal amount of cover assets exceeding the nominal amount of outstanding covered bonds (typically in % of nominal amount of outstanding covered bonds)
Rating-supporting overcollateralisation	Minimum overcollateralisation expected to support the assigned covered bond rating in %
Rating buffer	Number of notches of additional protection a covered bond rating has but which cannot be factored in as the highest rating is already achieved. Based on the distance between the issuer rating and the assigned covered bond rating, and the various uplifts assigned.
Legal framework	A broad system of rules that governs and regulates the issuance and management of covered bonds
Asset segregation	Provisions to effectively ring-fence the cover pool (including cover assets, substitution and liquidity assets, derivatives, and overcollateralisation) from the general insolvency estate in case of an issuer default.
Resolution regime	Regulatory framework of resolution tools for bank failures that safeguard the continuity of the bank's critical functions and financial stability
Scope PM	Scope's Portfolio Model – a Monte Carlo simulation model used to analyse the credit risk of more concentrated asset pools
Mean default rate	The expected issuer-specific lifetime default rate of cover assets
Coefficient of variation	The standard deviation of defaults divided by the mean default rate
CobEL	Scope's cash flow model calculating the expected loss of covered bonds
Asset liquidity premium	Premium added to the interest rate discount curve when calculating the net present value of the cover pool in case of an asset sale
CPT covered bonds	Conditional pass-through covered bonds; covered bonds whose repayment obligations switch from a bullet to an asset repayment-dependent pass-through after certain events
SARA clause	Selected Assets Required Amount clause; legal clause preventing an alternative manager from liquidating cover pool assets above the maturing covered bond's proportional share of total assets.
SLRA clause	Supplemental Liquidity Reserve Amount clause; legal clause specifying the covered bonds liquidity reserve to reduced liquidity risk



Covered Bond Rating Methodology

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