SCOPE | Ratings

CRE Loan and CMBS Rating Methodology

Structured Finance

16 December 2025

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1. Introduction

1.1 Scope of application

This methodology supplements our General Structured Finance Rating Methodology for the rating analysis of debt instruments secured by commercial real estate (CRE). This should be read together with the Counterparty Risk Methodology.

We define a CRE debt instrument as either direct exposure to CRE loans or securitisations of CRE loans i.e. commercial mortgage-backed securities (CMBS). Our definition of CMBS includes collateralised loan obligations (CRE CLO), asset-backed securities (CRE loan ABS), CRE debt funds or similar CRE debt structures. In this document, we refer to these jointly as CRE instruments and use CMBS when referring to specific analytical elements which apply to securitisation only.

The methodology applies to both the initial ratings and the monitoring of CRE instruments, primarily of income-generating CRE, and non-granular CMBS. CRE instruments exposed to assets under construction and refurbishment, which imply business risks beyond the cash flow projected for existing or future lease contracts, will be assessed on a case-by-case basis.

The methodology is applicable to instruments secured by CRE located in Europe but can also apply to jurisdictions where the CRE market and institutional framework are similar.

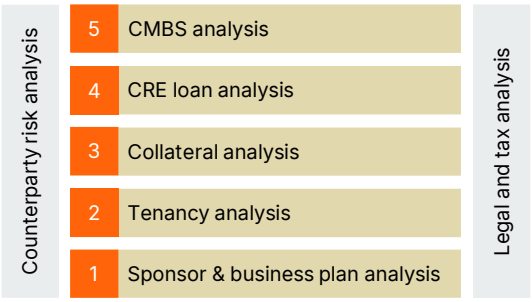
Rating scales and rating definitions are available on scoperatings.com.

1.2 Key components

Our approach to rate CRE debt instruments is structured in the following order: i) the assessment of the quality of the sponsor and its business plan; ii) tenancy profile and rental income; iii) the characteristics of the collateral, and iv) the CRE loan's terms and conditions.

Our approach to rating CMBS instruments is subject to the degree of concentration of the underlying loans. For very concentrated CMBS transactions, we will build upon the line-by-line cash flow analysis of the underlying loans. Alternatively, for granular CMBS secured against more than ten loans, we may assess the credit quality of the underlying CRE loans following the portfolio concentration risk approach described in our General Structured Finance methodology.

Finally, we incorporate legal, tax and counterparty considerations.



1.3 Data sources

Information needed to rate a transaction can be found in the Appendix 5.2 Transaction type expected data package for a credit rating.

Key assumptions in this methodology are informed by various sources, including the following: i) global real estate services firms: CBRE, Savills, JLL, Knight Frank, Cushman & Wakefield and Chatham Financial; ii) major institutions responsible for monetary policy and financial stability and supervisory entities: the Bank of England, the European Central Bank, the Bank for International Settlements, Basel Committee on Banking Supervision and the Financial Conduit Authority; iii) statistical institutions: Eurostat, and the Office for National Statistics; iv) Energy performance certification providers: the Global Real Estate Sustainability Benchmark, the UK Energy Performance Certificate, the Building Research Establishment Environmental Assessment Method (BREEAM), Leadership in Energy and Environmental Design (LEED), and Haute Qualité Environnementale (HQE).

2. Executive summary

This document provides the latest update to Scope Rating GmbH's (Scope) CRE Loan and CMBS Rating Methodology. It incorporates editorial changes and the following amendments relative the methodology published in December 2024 that are all non-material:

- Tenant default probability assumptions made more explicit for unrated tenants in section 3.2.1.
- Leasing commission removed from property costs in section 3.3.1. It is clarified in section 5.5 Glossary that leasing commission can be considered as a part of the non-recoverable costs where appropriate. The reason for this edit is that leasing commissions are usually paid from equity. Loan defaults are extremely unlikely to be caused by a missed leasing commission payment.
- Disclosure of liquidity enhancement requirements under sections 3.4.4 CRE specific characteristics and 3.5.2 CMBS specific characteristics to align with the General Structured Finance Rating Methodology.
- Additional details provided to the method of analysis of CMBS transactions secured by a granular portfolio of underlying loans. Section 3.5.1.
- Removal of the "CRE loan maximum recovery" framework. The framework is no longer relevant in generating modelling results due to the maximum allowed EL/PD distance, having no impact in driving modelling outcomes.
- Addition of new section 5.3.5 describing key characteristics of transactions based on Commercial ground leases.

Methodology highlights and expected loss framework

Fundamental cash flow analysis. Our methodological framework builds upon a detailed cash flow analysis of underlying collateral. Projected cash flows are key in determining the term default risk and the refinancing default risk of CRE instruments, while discounting projected cash flows determines the collateral value and, ultimately, the estimated recovery value.

Yield-driven refinancing default risk. Scope exit debt yield[1] compared to an all-in refinancing rate drives our assessment of refinancing default risk. The all-in refinancing rate is a function of rating-conditional financing conditions, the cost of equity, the expected loss, potential asset- and transaction-specific factors and collateral diversification.

Transaction-specific assumptions. We tailor our assumptions to the asset type, location, sponsor capabilities and tenants. This enhances credit-risk differentiation between transactions.

ESG factors. We assess quantitative and qualitative ESG factors that affect the creditworthiness of CRE instruments.

Scope applies an expected loss approach to rating CRE instruments, in accordance with our General Structured Finance methodology. We derive an instrument's expected loss and expected weighted average life, and benchmark them against Scope's idealised expected loss tables to derive a quantitative output. We also apply a degree of tolerance between our probability of default outputs and our expected loss outputs as defined in our General Structured Finance Methodology.

The probability of default on a CRE loan is a function of a) the probability of a term default, which relates to the borrower's failure to service its contractual interest and principal payment obligations during the term of the CRE loan, and b) the probability of a refinancing default, which relates to the borrower's failure to refinance a CRE loan at maturity. Recovery proceeds after foreclosure are driven by the stressed collateral value following a discounted valuation approach, net of foreclosure and liquidation costs. For CMBS transactions we also consider the note structure and payment waterfall together with structural features that can mitigate the impact of loan defaults on note performance.

Our CRE-specific expected loss approach blends a stochastic (Monte Carlo) simulation model for non-granular tenancy defaults along with a series of rating-conditional[2] collateral assumptions (rental value haircuts, void periods, structural vacancy rates, discount rates, interest rates) and non-rating conditional collateral assumptions (such as estimated rental

[1] Calculated as the ratio of total annualised cash flows generated by collateral and available for debt servicing relative to the outstanding principal balance of a CRE loan.
[2] The rating conditional assumptions are derived through linear interpolation between the CCC and AAA levels.

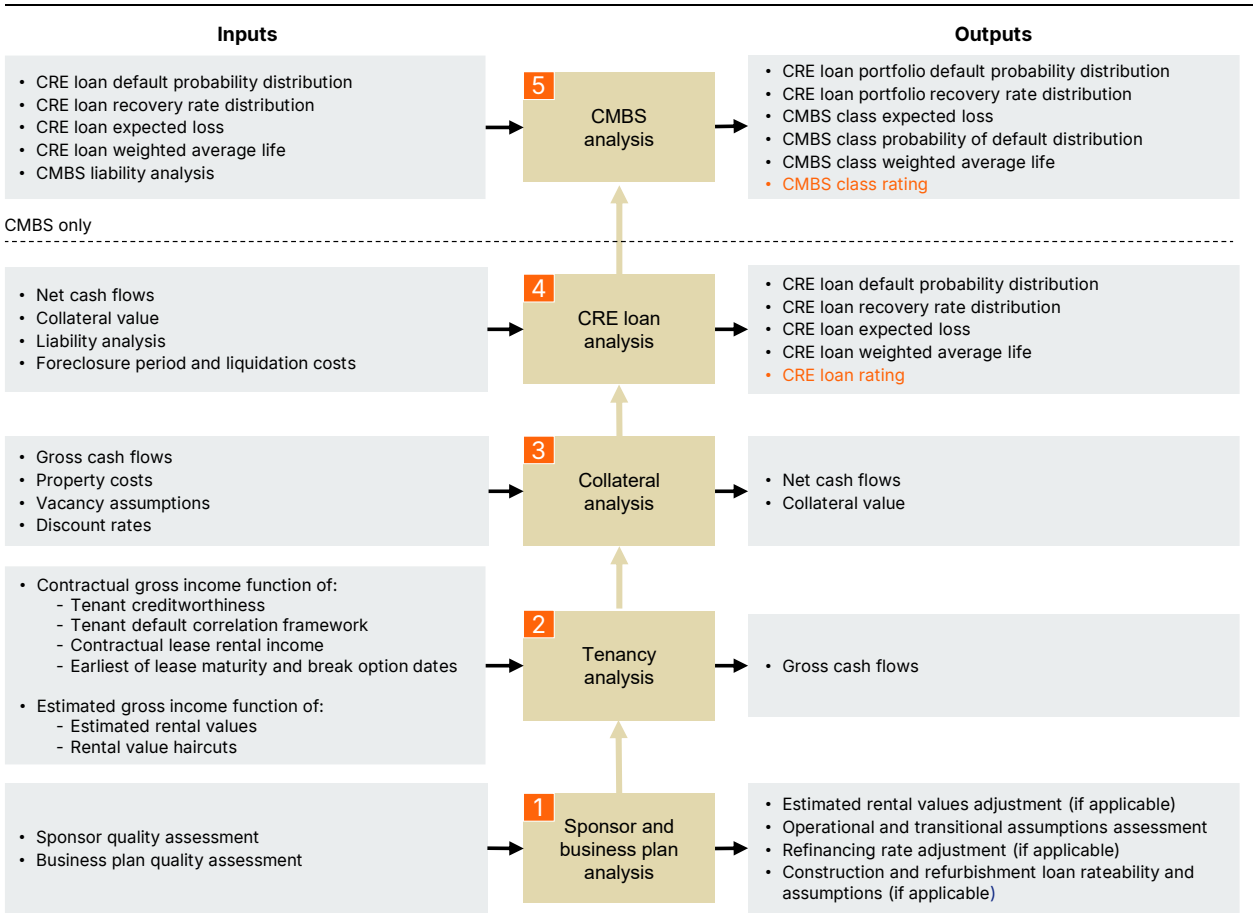
values, senior costs, property costs, structural vacancy rates, terminal rental value haircut, foreclosure period and liquidation costs, etc.).

We simulate tenant defaults based on their individual creditworthiness alongside the tenant default correlation framework in order to determine path-dependent gross and net cash flows. Gross cash flows are composed of contractual income and estimated rental income following a tenant's default or upon the earliest of the lease maturity and the first lease break option. Net cash flow is gross cash flow net of property-level and unit-level costs, and vacancy assumptions.

3. Detailed analytical framework

This section covers the building blocks of our qualitative and quantitative bottom-up analysis, also illustrated in Figure 1.

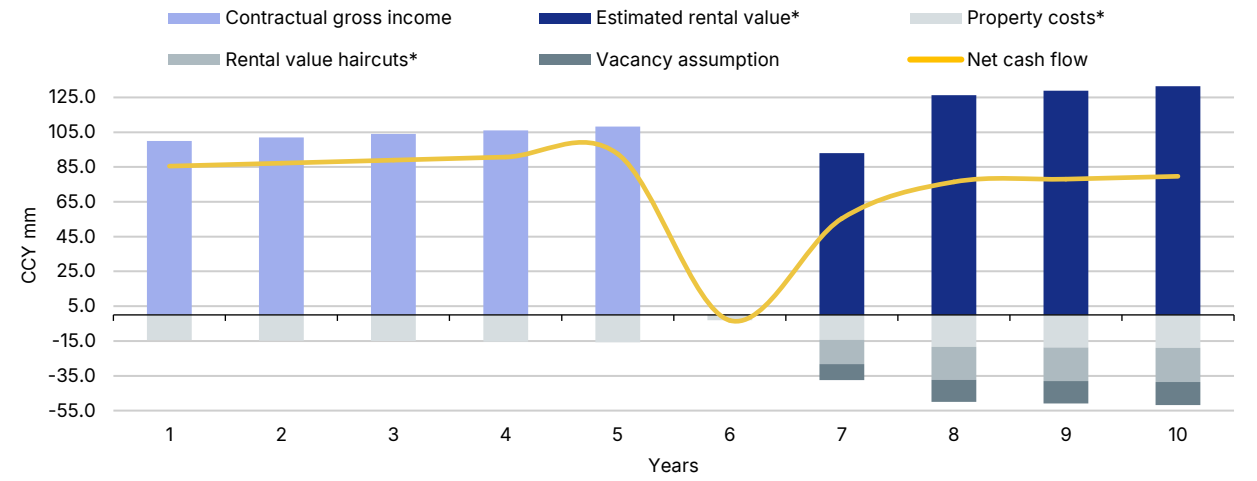
Figure 1. Analytical building block details



Note: For further details, please see Scope's Sub-sovereigns Rating Methodology.

Source: Scope Ratings

Figure 2. Illustrative net cash flow for a standard CRE property at a BBB rating stress



*rating-conditional assumptions

3.1 Sponsor and business plan analysis

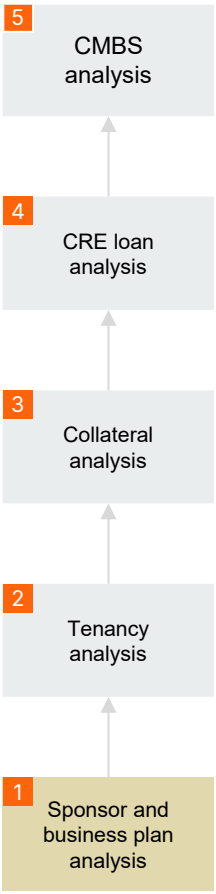
3.1.1 Operational and transitional CRE

We perform a qualitative assessment of the sponsor and of the business plan, examining the likelihood of supporting the transaction and the ability to ensure refinancing. A sponsor's creditworthiness, competence, and reputation are factors to a project's execution risk, or unexpected challenges that a transaction may face during its life.

With regards to the sponsor, we consider factors such as i) financial capacity and market position; ii) investment experience and risk management; and iii) evidence of willingness to support the transaction if needed. Our analysis also considers other stakeholders where relevant for the credit analysis in terms of their quality, experience and track record as well as how well their interests align with those of the sponsor. Examples of stakeholders are asset managers, collateral managers and special servicers.

The sponsor assessment will be considered in the refinancing rate adjustments in the two years prior to the transaction maturity date: if the sponsor is weak, or if no robust refinancing plan has been presented, we will adjust the CRE instrument's refinancing rate by at least +50 bps (see section 5.1 CRE loan all-in refinancing rate calculation).

The business plan will also drive transaction specific rating-conditional assumptions such as stabilisation periods for transitional assets, or void periods and structural vacancies, if no adequate capex is planned.



3.1.2 Construction and refurbishment CRE

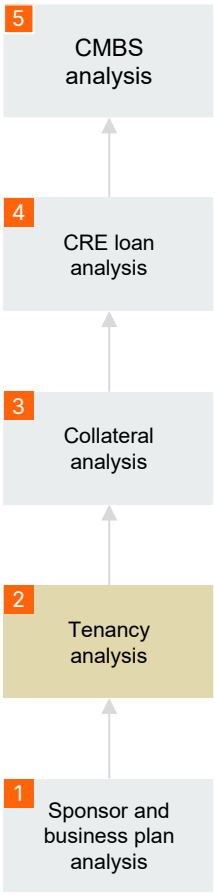
Our sponsor and business plan analysis for CRE transactions exposed to development risk is consistent with the operational and transitional CRE analysis framework. This assessment also forms an input to our scoring framework for construction and refurbishment risks (see Appendix 5.3.1). The scoring framework detailed in Figure 19 reflects our assessment of the credit risks associated with the financing purpose, time contingency, cost contingency, counterparty quality and refinancing prospects at practical completion/stabilisation. The score indicates the rateability of a transaction and the rating-conditional assumed development delays, cost overruns and additional liquidation costs. Projects scoring below 2 are typically rateable under this methodology.

Development plans must be realistic in terms of costs and the timing of construction and refurbishment. We expect debt servicing to be covered either upfront by pre-funded interest reserves, interest capitalisation or tangible guarantees

provided by strong guarantor (preferably rated), or by income-generating assets. We also assess any timing and cost buffers and contingency plans that allow for unexpected events as well as the priority of disbursements between the debt and equity. We assume a term default has occurred on a CRE capital expenditure loan if the loan's stressed loan-to-net value is greater than 100%, irrespective of interest reserves available or interest capitalised.

3.2 Tenancy analysis

The rent schedule of a transaction is a fundamental part of the analysis. The rent schedule provides information for each unit, such as occupancy status, tenant identity and key commercial lease terms which are vital to the financial health and operational status of the transaction. The tenancy credit risk analysis helps in determining whether a transaction is prone to term default or refinancing default. We estimate gross cash flows consisting of i) contractual gross income up to the earlier of lease break or termination and the tenant default; and ii) estimated gross income with rating-conditional rental value haircuts applied upon relet after a rating-conditional void period.



3.2.1 Tenant credit quality

For each period, we determine tenant solvency using a stochastic approach based on the tenant's creditworthiness and our tenant default correlation framework.

We assign a default probability to each in-tenancy occupant based on its credit quality. We will first consider ratings performed by Scope but will also consider external and public ratings by regulated and supervised credit rating agencies, and/or rankings by third-party credit assessment providers, adjusted where necessary.

When no such rating or assessment is available, we perform a credit quality assessment based on available data on comparable benchmarks. We assume that unrated tenants have a credit quality aligned to the average credit quality of small and medium-sized enterprises (SMEs) in their respective countries. Based on data from the European Banking Authority's Risk Dashboard or similar sources, and adjusting it to reflect the subject SME group, a benchmark credit quality assumption can be derived. The benchmark credit quality assumption we assume is typically aligned with a default probability in the BB to CCC range in our Idealised Default Probability Table. In general, we apply a clustering concept to group the tenant default probability assumption for different countries. Figure 3 shows our ranking of the default probability assumption where Cluster 1 contains the countries with the lowest tenant probability of default assumptions and Cluster 5 the highest. Cluster 5 is also the base assumption used for all other relevant countries not mentioned in the previous clusters.

Figure 3. Jurisdiction clusters

Cluster	Countries
1	Sweden, Germany, Denmark
2	Finland, Czech Republic, Luxembourg, Austria, Hungary, Norway, France, Belgium, USA
3	Switzerland, Slovenia, Poland
4	Netherlands, UK, Italy, Slovakia, Spain, Ireland, Portugal
5	Romania and all other countries

Source: Scope Ratings

We may conduct a dedicated tenant analysis for CRE instruments that are highly dependent on one or a few tenants (i.e. anchor tenants or specialist operators), particularly for single asset single tenant CRE or properties of an esoteric nature, credit tenant lease and commercial ground lease transactions (see 5.3.2 Credit tenant lease and 5.3.5 Commercial ground lease for further details). We do not use our stochastic framework for highly granular CRE tenancies (generally in the residential sector such as

multi-family properties or student accommodations), thus we do not assess individual tenant quality. Instead, we apply a rating-conditional structural vacancy assumption, which also embeds assumed void periods (see Figure 8).

Figure 4 exhibits the market risk factors which we use for creating tenant default dependencies. The weights attributed to each factor are defined as the square root of the respective correlation parameters and ultimately determine the portfolio's tenant default-rate distribution. We may adjust the correlation framework if a transaction deviates significantly from market standards or if tenants have exceptional correlations (e.g. anchor tenant in a shopping centre) that are not addressed by the market risk factors or parameters below.

Figure 4. Indicative correlation parameters for a CRE loan[3]

Market risk factor	Parameter	Common dependencies addressed
Global	**2.0%**	Macroeconomic shocks
Asset location (macro – country)	**5.0%**	Domestic economic and political developments
Asset location (micro – region/city)	**10.0%**	Local economic and political developments
Tenant industry	**10.0%**	Business cycles and sector outlooks

3.2.2 Contractual gross income

Contractual gross income is based on the contractual rent as long as the tenant is solvent. For properties relying on operating businesses that do not have a contractual gross income (including turnover rent), we estimate a gross income based on historical and expected future performance of the businesses. We give credit to contractually agreed fixed rent indexation or inflation-linked indexation (capped at the long-term average levels of 2.0% annual inflation in Western Europe). For granular portfolio of rental contracts, we may model the income streams on an aggregate basis.

We generally do not give credit to contractual gross income beyond the first break option. We may make an exception on certain occasions, for example, for tenants that have multiple leases with different break options or when the break notification deadline has passed.

3.2.3 Estimated gross income

Estimated gross income is a function of Estimated Rental Value (ERV), inflation and Rental Value Haircuts (RVH).

The starting point of the estimated gross income is the ERVs provided in the rental schedule or valuation report. We may adjust these values if they differ significantly from third-party research or rental benchmarks[4] and if they are not aligned with the business plan or supported by anecdotal evidence from the sponsor. ERVs are expected to increase in line with inflation (2% per annum).

We then apply rating conditional RVH to the ERV. Figure 5 reflects our 'CCC' and 'AAA' benchmark assumption for the main sectors across jurisdictions. The AAA rating scenario's RVH reflects rental level stress related to a severe recession, which we anchor at 30% for non-residential CRE. The residential sector has exhibited notably lower historical rental volatility in comparison to other sectors, warranting a lower haircut (15%). RVH assumptions for other rating scenarios are derived from a linear interpolation between the AAA level and no haircut at the CCC level.

We may apply a terminal RVH to ERV, to normalise rental levels to a long-term average and embed our long-term view in asset-type-specific rental levels when appropriate.

Figure 5. Illustrative selected sectors RVH

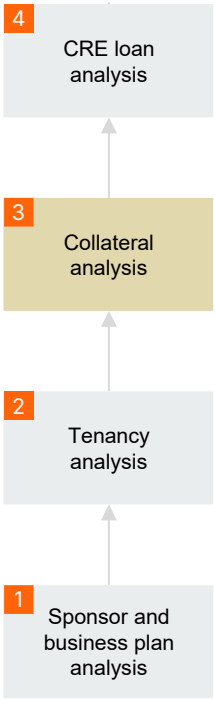
Rating level	CCC	AAA
Office	0%	30%
Retail		
Industrial & logistics		
Residential		15%

Sources: Scope Ratings

[3] We typically use the same 'industry mapping' as in the SME ABS Rating Methodology.
[4] Rental benchmarks are deal specific and generally derived from independent and recognised third party valuers.

3.3 Collateral analysis

Our collateral analysis is based on the gross rental income derived from our tenancy analysis and results in determining both: i) net cash flows; and ii) the collateral value. Net cash flows are a function of gross rental income minus property-level (including unit-level) costs, void periods, and structural vacancy rates. If a loan defaults, the lender has the right to enforce and sell the assets to recover its outstanding debt. The value of the collateral mitigates potential losses. Scope uses a discounted cash flow valuation approach to determine the collateral's value.



3.3.1 Property costs

Asset-specific property costs are composed of i) non-recoverable operating costs; ii) maintenance capital expenditures; and iii) management, letting and fit-out costs.

We expect rental schedules to contain gross rental income by unit and the associated costs at either unit, property or portfolio level. Non-recoverable operating costs generally include real estate taxes, insurance and utility expenses. They depend on the lease and property types and are determined based on valuation reports, lease agreements or external sources. Maintenance capital expenditures are generally based on the latest collateral valuation and technical due diligence reports. We estimate higher expenditures if we deem budgeted maintenance capital expenditure to be insufficient. Management and letting costs are a function of the relevant contractual agreements.

Figure 6 represents illustrative ranges of property costs observed in Europe for the main CRE asset types. Transaction-specific and precise property costs may deviate from such levels based on property specifics, due diligence reports or local market surveys.

Figure 6. Illustrative ranges of property costs

	Application level	Metric	Property costs
Property management fee	Portfolio	% of GRI[5]	0.5%-2.5%
Maintenance capital expense	Property	Currency per sqm/sq ft[6]	0.5-10

Sources: Scope Ratings

3.3.2 Vacancy assumptions

CRE vacancy assumptions are temporary (void periods) or structural.

Void periods reflect vacancies following a lease discontinuation event (break/scheduled maturity of lease or tenant default). In effect, they limit rental income after initial lease end or tenant default. They are a function of i) property type; ii) location; and iii) rating stress assumption. They also incorporate a reletting period that includes marketing and rent-free periods. They significantly alter available cash flows for concentrated tenancy bases but have less of an impact for highly diversified tenancy bases. For granular residential or operationally intensive CRE (hotel or whole business akin transactions) we embed void periods within our rating conditional structural vacancy assumptions.

Figure 7. Illustrative ranges of rating conditional void period assumptions

	Application level	Metric	CCC	AAA
Standard CRE	Unit	Months	6	24
Granular residential or operationally intensive CRE			0	

Sources: Scope Ratings

Structural vacancy represents the assumed percentage of space that is permanently vacant. For a standard CRE property, it is a function of i) location; ii) property type; and iii) structural and regulatory shifts affecting the property. For most asset types we would generally use a non-rating conditional structural vacancy rate of 10% while for granular residential or

[5] As a percentage of Scope assumed gross rental income.
[6] As a local currency amount per lettable area.

operationally intensive CRE we would typically model 5% at CCC and 30% at AAA. Transaction-specific structural vacancies may deviate from such levels based on property specifics, historical performance and due diligence reports.

Figure 8. Illustrative ranges of rating conditional structural vacancy assumptions

	Application level	Metric	CCC	AAA
Standard CRE	Property	% GRI	10%	
Granular residential or operationally intensive CRE			5%	30%

Sources: Scope Ratings

3.3.3 Rating-conditional collateral value

The stressed collateral value is calculated at each period using a discounted cash flow over a 10-year horizon, plus a terminal asset value. The terminal asset value is the present value of the terminal net cash flow divided by the capitalisation rate (the discount rate minus our annual inflation rate assumption). The collateral value is computed at each payment date (including the loan maturity date) to assess the loan-to-value for potential covenant breach or refinancing default.

The CCC discount rate is a function of i) the most relevant market yield[7] for the property; and ii) the inflation rate assumed at 2.0%.

The AAA discount rate[8] is a function of i) rating-conditional interest rate; ii) the transaction's remaining term; iii) the CRE historical average spread; and iv) the property sector volatility adjustment. We fix the discount rate at the rating conditional value intersecting with the remaining term of the transaction, under the most stressful scenario (rising or decreasing interest rates - see section 5.4 Rating-conditional interest rate assumptions). Based on our historical analysis of yields over their respective treasury yield, we have determined an average historical CRE spread of 3% across all sectors but residential, which is 2%. To cater for sector specific structural shifts in demand, a sector volatility premium or discount of up to 100bps can be applied depending on the property sector outlook (Figure 9 and Figure 10). We may deviate from the sector volatility premium or discount if the properties are of better or worse quality than the average stock.

Figure 9. Property sector volatility discount or premium in basis points

Outlook	Positive	Marginally positive	Marginally negative	Negative
Discount or Premium	-100bps	-50bps	+50bps	+100bps

Sources: Scope Ratings

Figure 10. Illustrative AAA-stressed discount rates for two and five-year remaining term transactions

Remaining term	2 years		5 years
Main property sector	GBP[1]	EUR[1]	All
Office[2]	11.49%	10.90%	13.00%[3]
Retail	10.49%	9.90%	12.00%
Industrial & logistics	9.99%	9.40%	11.50%
Residential	8.99%	8.40%	10.50%

[1] Spot 3-month interbank rate level assumed at 3.97% for the GBP and 2.01% for the EUR in this example (data from 6th November 2025).

[2] The sector volatility adjustment is assumed at +100bps for Office, 0 for Retail, -50bps for Industrial & logistics, -50bps for Residential, -50bps for PBSA, 50bps for Life Sciences, 0 for Hospitality and -100bps for Data Centres.

[3] The AAA-stressed discount rate for a five-year term Office transaction is calculated as 9% (AAA plateau for all interest rate tenors of major western currencies) plus 3% (the CRE average spread) plus 1% (the negative property sector volatility adjustment premium).

Sources: Scope Ratings, Eurostat, Bank of England, CBRE, Savills, JLL, Knight Frank, Cushman & Wakefield, Chatham Financial

3.4 CRE loan analysis

We analyse CRE loans to determine their probability of default and expected loss, in accordance with the transaction structure and priority of payments. We also consider qualitative factors in the final rating assessment, such as the sponsor

[7] We aim to use the metric that most accurately reflects the weighted average annual return of the property over the projected 10-year period – the net equivalent yield (NEY). Should the NEY not be available, the discount rate can also be derived using the net initial yield or reversionary yield where relevant.

[8] The AAA discount rate minimum absolute stress level is floored at 125% of the CCC discount rate.

quality, property characteristics, and credit metrics in relation to peer transactions. As a result, the rating outcome may differ from the quantitative output.

3.4.1 Term default probability

We define a CRE loan term default as a borrower's failure to service interest or principal obligations during the term of the loan.

3.4.2 Refinancing default probability

A CRE loan refinancing default occurs if the loan's debt yield at maturity is lower than our estimated all-in refinancing rate of the rated instrument, or if the rating-conditional CRE loan-to-value calculated by Scope exceeds 100%.

Scope's exit debt yield may be further stressed should certain contracted lease cash flow expire shortly after loan maturity.

Our all-in refinancing rate at maturity is a function of: i) rating-conditional interest rate assumptions; ii) the cost of equity; iii) the risk premium; iv) any transaction-specific adjustment; and v) the collateral diversification discount rate. Please refer to 5.1 CRE loan all-in refinancing rate calculation for further details.

3.4.3 Recovery rate analysis

We determine an effective collateral liquidation value upon default considering i) foreclosure and liquidation period; and ii) foreclosure and liquidation costs.

We assume a fixed foreclosure and liquidation period of 24 months after the CRE loan default. This can be supplemented by sensitivity analyses considering a longer foreclosure period in non-creditor-friendly jurisdictions, non-creditor-friendly transaction structures and stressed scenarios. We assume that the properties continue to accrue net cash flows during the foreclosure and liquidation period based on our legal analysis. Net cash flows are used to service the debt including any additional default interest penalty and reduce the loan amount (in case of excess).

Foreclosure cost assumptions are a function of the asset's locations and the transaction's characteristics. We would generally model according to Figure 11.

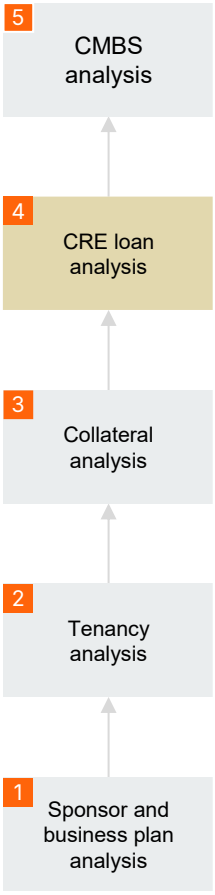


Figure 11. Illustrative foreclosure and liquidation costs

	Level of application	Criteria	Costs
Legal costs*	CRE loan	Jurisdiction & deal complexity	1%-2.5%
Other costs (notary, broker, etc.)	CRE value	Jurisdiction & deal complexity	8.0%
CMBS special servicer	CRE value/income	Jurisdiction & deal complexity	0.25%-1.50%

*Capped at EUR 2m local currency equivalent

Sources: Scope Ratings

3.4.4 CRE specific characteristics

Loan covenants. We model non-default financial covenants that we deem effective and not subject to the discretion of the borrower. These covenants are usually based on cash flow performance (e.g. interest, debt service coverage or debt yield) or leverage performance (e.g. loan-to-value). These covenants generally accelerate the reduction in liabilities. We do not model default covenants (generally based on the same cash flow or leverage performance but at more stressed levels) because we believe that when default covenants are breached but cash flows remain sustainable, consensual solutions remain more likely than liquidation. We do consider them qualitatively in our legal analysis and monitor distance to covenants during the life of the transaction. We assume a term default if the stressed loan-to-net value of a construction or refurbishment CRE loan exceeds 100% at any point in time.

Refinancing liability. We assess the debt amount to be refinanced based on the amortisation profile and the debt structure. We focus on the specific debt instrument to be refinanced for senior/mezzanine financing and the full debt to be refinanced for an A/B structure or the whole loan. Unlike senior/mezzanine financing, class A/B structures are less favourable for senior lenders because i) B loan lenders are not structurally subordinated as they are for senior/mezzanine financing; ii) B loan lenders have a direct lien on the mortgage and borrower collateral; and iii) a default on the B loan generally triggers a default on the A loan.

Senior expenses. The transaction's legal documentation generally defines senior expenses. Examples are fees paid to the agent, security agent, trustee, corporate service providers, paying agents, calculation agents and asset managers. We adjust senior expenses that are well below market standard or are assumed null and void because the arranger is performing the service. Taxes can relate to properties or services, such as value-added tax on management expenses or capital expenditure. Such taxes are usually specific to the property's jurisdiction and are included in our cash flow calculation. We usually consider that counterparty expenses, head leases and taxes rank senior to debt service on the rated instruments, but if the contractual priority of payments states differently, we may use a different approach.

Extension option. We calculate an expected loss over the entire scheduled lending period, including extension periods. We also assume that any extension on the term of a CRE loan is subject to the renewal of the hedging agreements as per the legal analysis. We may consider a different hedging strike rate to the initial one if it resets at the extension option date based on interest coverage multiple. We also run a sensitivity analysis of rated transactions without extension options to assess its impact on the final modelling outcome.

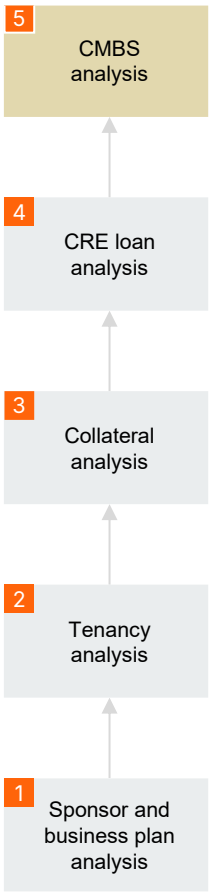
Liquidity enhancement. A liquidity buffer allows the issuer to continue meeting payment obligations to investors and counterparties in the event of unexpected near-term shortfalls due to temporary property underperformance, unexpected costs or a counterparty disruption. Scope may only assign ratings in the AA and AAA categories if minimum liquidity coverage thresholds are met subject to the complexity of the transaction, in line with the GSF methodology. The complexity is assessed on a deal-by-deal basis and includes factors such as the regularity of cash flow, the number of loans, the tranches of financing instrument, and servicer replacement provisions.

3.5 CMBS analysis

We extend the analysis to determine the probability of default and expected losses of the respective CMBS classes, in accordance with the transaction's liability structure and priority of payments. We also consider qualitative factors in the final rating assessment, such as note-to-value levels and other relevant credit metrics in relation to peer transactions. As a result, the rating outcome may differ from the quantitative output.

3.5.1 Scope of analysis

The analysis of the underlying portfolio is subject to its degree of concentration. Transactions backed by less than ten CRE loans are covered by the CRE Loan and CMBS Rating Methodology. We would generally assess the credit quality of more granular CMBS following the standard approach to assess obligors credit risk based on their portfolio concentration as described in our General Structured Finance methodology[9]. Loans accounting for 10% or more of a portfolio will be assessed on an individual basis.



3.5.2 CMBS specific characteristics

Tail period. Collateral securitised in CMBS transactions have a shorter final maturity than the notes' final maturity date thus allowing for a work-out period or tail period to maximise the recoveries on the notes.

CMBS covenants. We model CMBS non-default covenants such as cash trap that we deem effective and not subject to the discretion of the borrower. These covenants are usually based on cash flow performance (e.g. interest, debt service coverage or debt yield) or leverage performance (e.g. overcollateralisation or loan-to-value). These covenants generally accelerate principal repayment to the most senior class and, in some instances, prevent reinvestment in new collateral. We do not model CMBS default covenants (generally based on the same cash flow or leverage performance but at more conservative levels).

Ramp-up and reinvestment period. We analyse the risk of portfolio quality migration by considering the track record and strategy of both the originator and the collateral manager, the characteristics of the asset type, and the (re)investment guidelines and covenants in the structure. As assets can be replenished during the reinvestment period – usually subject to portfolio profile tests and collateral quality tests – the transaction portfolio's weighted average life (WAL) will be longer than that of the initial portfolio. We assume that, during the reinvestment period, scheduled principal repayments are reinvested in collateral with similar risk profile to that of the model portfolio.

In the case of partially ramped up transactions, we assess whether the indicated portfolio target size, number of assets and obligors as well as weight distributions are commensurate with the transaction's strategy, the asset manager's origination capacities and the length of the ramp-up period.

Note to Value. The note-to-value ratio is incorporated as a key metric in the assessment process. While the underlying credit quality of the securitised loan(s) and their cash flow stability determines the resilience of the securitised structure under stress scenarios, the NTV not only serves as benchmarks with other similar transactions but also reflects the underwriting standards. The higher the NTV the less likely the note can sustain a value decline commensurate with a high rating stress.

Controlling class. In CMBS transactions, the most junior tranche generally serves as the controlling class, with rights to direct the special servicer and approve loan workout strategies. Different tranche holders may have divergent preferences regarding the appropriate workout strategy to protect their respective interests. We analyse whether controlling class mechanisms optimise overall recovery for the transaction and the rated tranches. We assess whether the transaction and rated tranches are adequately protected through senior control trigger events, which limit the junior tranche's decision-

[9] Credit Estimate or mapping of external credit measures can be on based on sustainability of cash flow, leverage, asset class and sponsor experience.

making authority when the interests of the senior tranche are at risk. Additionally, we examine whether special servicer agreements obligate the servicer to maximise the present value of total recoveries across all tranches.

Available fund cap. In CMBS structures, interest payments to the most junior tranche holders may be limited when cash flow available for distribution is temporarily insufficient to cover interest due across the capital structure. This is typically implemented through an available funds cap or a deferrable interest mechanism. We incorporate this senior tranche protection in our analysis by adjusting interest-rate stresses and cash-flow assumptions during the workout period as appropriate.

Loan modification. A CMBS may allow administrative and criteria-based CRE loan modifications. Loan modifications give the sponsor more flexibility to amend certain loan terms without requiring a loan's refinancing or its exclusion from the CMBS. Loan modifications may weaken loan-level and pool-level credit metrics as well as reduce available excess spread. We assess the scope of permitted loan modifications as well as the quality and robustness of limiting measures such as the ones preventing credit-quality migration, including interest coverage ratio[10] and overcollateralisation[11] test maintenance, minimum loan-to-value[12] levels, loan eligibility criteria and limits to the number of loan modifications.

CRE loan prepayments. Our base case usually assumes no loan will prepay ahead of its fully extended maturity (including extension options). For multi-loan CMBS, we perform a sensitivity analysis based on the prepayment of the strongest loan(s) according to our analysis.

Liquidity enhancement. For CMBS we apply the same principles as disclosed in section 3.4.4 CRE specific characteristics, with the liquidity enhancement more applicable to loan underperformance rather than property underperformance. We also consider other CMBS-related liquidity protection mechanisms where relevant.

4. Complementary analysis

4.1 ESG factors

CRE investors are increasingly focused on ESG factors. We consider credit relevant ESG factors that affect the CRE's net cash flow, value and, ultimately, default probability and recovery. Such factors may affect relevant assumptions including estimated rental values (section 3.2.3), property maintenance costs and void (section 3.3.1), and the refinancing rate adjustment (Figure 17).

Environmental

Our analysis on the environmental aspect involves an examination of factors such as i) the presence of asbestos; ii) abandoned underground storage tanks; iii) ground and/or water contaminations; iv) and the borrower's climate change policies. We review capital expenditure plans, insurance liabilities against acute changes in climate, and third-party technical environment reports such as Phase I and Phase II reports when available. We expect relevant reports to provide an estimated budget and time to resolve major findings, that they are accounted for in the sponsors' business plans and preferably reserved upfront.

Our analysis give credit for certifications or scores provided by recognised certification provider on the CRE if deemed relevant.

We also consider the physical climate related risks of the assets such as flood and fire and there mitigants if any. In addition, we will review and strive to analyse the energy performance of the underlying assets in order to assess their compliance with current and expected environmental regulations.

Social

The social aspect analysis focuses predominantly but not exclusively on i) secular societal changes affecting consumer behaviour (e.g. e-commerce, working from home), ii) demography and living preferences (e.g. employment and affordability), iii) social regulations that may impact future cash flows such as rent control.

[10] Calculated as the ratio of total annual cash flows generated by secured collateral and available for debt servicing to the amount of interest a borrower is required to pay in any given period.
[11] Calculated as the secured collateral value over its outstanding debt principal balance.
[12] Calculated as the outstanding CRE loan principal balance over its secured collateral value.

Governance

The major focus for governance is to consider the transaction structure and the standard representation and warranties in addition to considering i) transparent priorities of payment; ii) transparent covenant calculations and collateral valuation assumptions; iii) rights, obligations, independence, and the alignment of interests and potential conflicts of interest among stakeholders; iv) ramp-up provisions and investment guidelines; and v) transparent reporting.

Figure 12. CRE credit relevant ESG factors

Environmental	Social	Governance
• Environmental contaminations • Physical risks or disasters • Energy efficiency	• Secular social trend • Demographic changes • Social regulations impact	• Transaction structure • Ramp-up provisions • Reporting

Sources: Scope Ratings

4.2 Legal and tax analysis

The legal and tax analysis is in line with those listed under the appendix 'Legal considerations in structured finance' of the General Structured Finance Rating Methodology.

4.3 Counterparty risk analysis

The counterparty exposure analysis is governed by Scope Ratings's Counterparty Risk Methodology.

4.4 Data adequacy, data guidelines and portfolio data template

We can provide our CRE loan and CMBS Excel input data template, available via Scope's CRE Loan and CMBS Scorecard[13]. We also welcome originator/sponsor data templates and can generally process any standard format (Excel and database formats are preferred for quantitative data). For CMBS, we expect reports on agreed-upon procedures to be issued by reputable and independent auditors which highlight any differences between data supplied to us by the issuer/arranger and the paper-based or digital data provided to auditors by the originators/sellers. We may have additional conference calls, operational review visits and property visits to complement the information received.

4.5 Rating sensitivity analysis

We test the resilience of the credit analysis against several main assumptions change. This sensitivity analysis has the sole purpose of assessing the sensitivity of our credit analysis to input assumptions and is not indicative of expected or likely scenarios. We may perform additional sensitivity analyses which are transaction specific.

Figure 13. Sensitivity tested[14]

Analytical assumption tested	Typical analytical assumption considered
Structural vacancy	200%[15]
Rental value haircut	120%[16]
Discount rate	120%[16]
Extension option	No extension
Cash trap/sweep	Waiver of cash trap covenants

Sources: Scope Ratings

4.6 Monitoring

The monitoring process is in line with the 'Monitoring' section of the General Structured Finance Rating Methodology. We specifically assess the performance trend of the rated instrument against covenanted trigger levels and review the assigned

[13] See Scope's CRE Loan and CMBS Scorecard for further details.
[14] In addition to the sensitivities disclosed in our General Structured Finance Rating Methodology.
[15] Multiplier for all rating scenarios.
[16] Multiplier for AAA, while all other rating scenarios stresses are interpolated linearly. Zero for CCC as CCC RVH is zero.

ratings accordingly. We expect to receive timely monitoring information, including the latest management reports, compliance certificates, business and capital expenditure plans, property valuation reports and rental schedules.

CRE and CMBS are an operationally intensive and dynamic asset classes. As such it relies on collateral managers, loan servicers to oversee and manage loan servicing and/or on special servicers to manage any distressed CRE loans. Material changes in the composition of a CRE portfolio or the structure of a CRE loan are common. However, if changes in the transaction performance are deemed immaterial for the current ratings, we may not require the re-run of or update of the tools and models supporting the current ratings[17].

[17] In line with the General Structured Finance Rating Methodology.

5. Appendix

5.1 CRE loan all-in refinancing rate calculation

We quantitatively consider a refinancing default if i) at the CRE loan's maturity, the CRE loan's exit debt yield is lower than our estimate of the all-in refinancing rate of the rated instrument; or ii) the rating-conditional loan-to-value calculated by Scope exceeds 100%.

The all-in refinancing rate is an integral part of our analysis and is a predominantly a function of the debt funding cost derived from the highest interest rate risk vector based on the 5.4 Rating-conditional interest rate assumptions. We also consider i) regulatory costs; ii) a CRE instrument refinancing rate adjustment, and iii) a diversification discount rate. We assume that all CRE instruments refinance for a five-year term as per market standards.

Regulatory costs

We acknowledge the regulatory cost for real estate lending by incorporating: i) a risk weight for capital allocation to real estate lending; and ii) a provision for a regulatory-loss rate into the all-in refinancing rate.

The risk weight relies on a simplified interpretation of the Basel framework[18] (standardised approach) for residential and commercial real estate exposures that are materially dependent on cash flows. The regulatory loss relies on a simplified interpretation of the internal ratings-based approach for specialised lending exposures from the Prudential Sourcebook for Banks, Building Societies and Investment Firms[19]. We apply a linear interpolation between loan-to-value (LTV) buckets.

Figure 14. Risk weights used to determine the capital held against each CRE loan

Risk weights (%) / LTV bucket	LTV ≤ 60%	LTV = 80%	LTV = 90%	LTV = 100%
Residential loan	35%	45%	60%	75%
CRE loan	70%	90%	110%	110%

Sources: Scope Ratings, Basel Committee on Banking Supervision

Figure 15. Regulatory loss

Regulatory loss (%) / LTV bucket	LTV ≤ 60%	LTV = 80%	LTV = 90%	LTV = 100%
Residential and CRE loans	0.40%	0.80%	2.80%	8.00%

Sources: Scope Ratings, Financial Conduit Authority

Diversification discount rate

We determine a diversification discount rate to reduce the refinancing rate. This acknowledges that diversification lowers refinancing default risk. It is a function of three equally weighted granularity factors: i) property number; ii) property type; and iii) property location. We calculate each diversification factor score following the inverse Herfindahl formula, with each factor capped at 0.5%:

$$\textbf{\textit{Diversification score factor (floor at 0)}} = \textit{Min}(0.5\%\,;\ \frac{\textbf{\textit{Herfindahl score}} - 1}{\textbf{\textit{Herfindahl score factor}}} * 0.5\%)$$

Figure 16. Diversification discount rate factors

	Credit rationale	Herfindahl score factor	Herfindahl score
Property number	Granular CRE portfolio provides cash flow stability and mitigates idiosyncratic risks	25	$= \frac{1}{\sum_{k=1}^{n} (\frac{Allocated\ collateral\ balance}{Total\ collateral\ balance})^2}$
Property type	Granular CRE type protects from sector structural changes	2	$= \frac{1}{\sum_{k=1}^{n} (\frac{Property\ type\ collateral\ balance}{Total\ collateral\ balance})^2}$
Property location	Granular CRE location protects from macro- and microeconomic risks	10	$= \frac{1}{\sum_{k=1}^{n} (\frac{Property\ location\ collateral\ balance}{Total\ collateral\ balance})^2}$

Source: Scope Ratings

[18] Available on the Bank for International Settlements website under Basel Framework, CRE – calculation of RWA for credit risk
[19] Available on the FCA website under section BIPRU 4.5.13

CRE instrument refinancing rate adjustment

Figure 17 presents examples of refinancing rate adjustment factors to our all-in refinancing rate. This acknowledges qualitative elements that influence a CRE instrument's probability of refinancing. The refinancing rate adjustment will be limited between -2% and +2%.

Figure 17. CRE instrument refinancing rate adjustment factor examples

	Premium	Discount
Property quality	Stranded assets (non-green, outdated assets lacking investment capital expenditure), non-stabilised assets, etc.	Brand new property, property with strong ESG credentials, etc.
Tenant credit quality	Main lease(s) expiring shortly after the transaction's term, etc,	A new long lease with an investment grade rated tenant, very granular tenant pool[20], etc.
Macroeconomic environment	E-commerce (retail), work-from-home trend (office), etc.	E-commerce (logistics), residential supply and demand imbalance, etc.
Structure and sponsor	Weak sponsor and/or no refinancing plan a year prior to the instrument maturity, weak or inefficient structure, etc.	ESG-criteria driven margin step-up/down, etc.

Source: Scope Ratings

Figure 18 give an example of our all-in refinancing rate for a five-year CRE loan.

Figure 18. All-in refinancing rate illustrative example

	Rating-conditional	Indicator	Calculation
Rating scenario (1)			BBB
Currency (2)			EUR
Real estate type (3)			Commercial
Leverage (4)	Yes*	Loan-to-value calculated by Scope at maturity	80%
Tenor of refinancing CRE loan (5)	No	Market standard five-year CRE loan	5
CRE loan remaining term to maturity (6)	No		3
Risk weight (7) = function (3, 4)	Yes*	Regulations	90.0%
Capital adequacy ratio (8)	No	Regulations	12.00%
Return on equity target (9)	No	Standard market rate	12.00%
Regulatory loss (10) = function (4)	Yes*	Regulations	0.80%
Funding yield (11) = function (1,2,6)	Yes	Rating-conditional interest rate risk assumptions	6.25%
Cost of equity (12) = 7 × 8 × 9	Yes*		1.30%
Risk premium (13) = 10 ÷ 5	Yes*		0.16%
Diversification discount (14)	No	Scope's diversification discount rate	-0.10%
CRE instrument refinancing rate adjustment (15)	No	Scope's adjustment	0.00%
All-in refinancing rate (16) = 11 + 12 + 13 + 14 + 15	Yes		**7.61%**

* indirectly rating-conditional because of the dependency to rating-conditional assumptions

Source: Scope Ratings

[20] Extremely granular tenant pool may be reduced, we would consider the actual diversification discount here

5.2 Transaction type expected data package for a credit rating

	CRE loans	CMBS
Sponsor/asset manager information		
Sponsor/asset manager presentation		✓
Business plan and cash flow projection (when available)	✓	✓
Transaction information		
Teaser/information memorandum	✓	✓
Structure chart	✓	✓
Data tape (rent roll and arrears)	✓	✓
Transaction documentation		
Issuance documents, facility agreement, intercreditor deed	✓	✓
Security agreements	✓	✓
Servicing agreements	✓	✓
Key side documents, fee letters, hedging documents	✓	✓
Legal and tax opinions	✓	✓
Due diligence and third-party reports		
Originator due diligence (for synthetic and SRT transactions)		✓
Sponsor and asset manager due diligence (for non-stabilised CRE)	✓	✓
Valuation report	✓	✓
Technical and environmental reports	✓	✓
ESG and sustainability reports	✓	✓
Agreed-upon-procedure reports		✓
Greenfield, brownfield and bridge financing projects		
Developer and construction team presentation	✓	✓
Borrower financial statement	✓	✓
Pre-sales/let plan and buyers'/tenants' profile	✓	✓
Construction plan, authorisations and costs follow-up	✓	✓
Miscellaneous		
Other data supporting the credit analysis	✓	✓
Monitoring		
Servicer report and management report	✓	✓
Up-to-date compliance certificates	✓	✓
Up-to-date valuation report	✓	✓
Up-to-date rent roll and arrears	✓	✓
Up-to-date account balances	✓	✓
Up-to-date business plan and capital expenditure plan	✓	✓
Up-to-date servicer site inspection reports	✓	✓
Originator information (for CRE CLO or debt fund transactions)		
Underwriting standards		✓
Internal credit risk model (PIT/TTC PD, rating scale, etc.)		✓
Historical performance (default, recovery, prepayment, etc.)		✓

Sources: Scope Ratings

5.3 Asset-type-specific analytics

5.3.1 Construction and refurbishment risks

Our construction and refurbishment score determines the rateability of a transaction at inception and is a multiplicative modifier for our assumptions. In general, the lower the complexity and the further advanced the project is, the more rateable is the transaction. The score reflects a credit risk assessment that equals the simple average of 10 criteria consolidated into five areas of credit risk: i) financing type; ii) time contingency assessment; iii) cost contingency assessment; iv) counterparty quality; and v) post-practical completion.

Each criterion is scored from 1 (low risk) to 5 (high risk) with a one incremental point scale between categories. A CRE instrument scoring lower than 2 is rateable under this methodology. The scoring framework is shown in Figure 19 below.

Figure 19. Scoring framework with guidelines and an exemplary project

Risk assessment[21]	High	Medium-high	Medium	Medium-low	Low	Example case	
						Assessment	Score
Score	5	4	3	2	1		1.8
Financing purpose	Large scale construction	Small scale construction	Full refurbishment	Light refurbishment	Tenant incentives	Light refurbishment	2.0
Project complexity	High	Medium-high	Medium	Medium-low	Low	Low	1.0
Advancement to date (% estimated construction time)	≥0% and <15%	≥15% and <30%	≥30% and <45%	≥ 45% and <60%	≥60% to unlimited	60%	2.0
Remaining time post practical completion to financing maturity	<6 months; or ≥0% and <15%	3-6 months; or ≥15% and <30%	6-12 months; or ≥30% and <45%	12-18 months; or ≥45% and <60%	>18 months; or ≥60% to unlimited	60m (300%)	1.0
Cost contingency	≥0% and <3%	≥3% and <6%	≥6% and <9%	≥9% and <12%	12% to unlimited	12.0%	1.0
Procured costs (% of budget)	≥0% and <15%	≥15% and <30%	≥30% and <45%	≥45% and <60%	60% to unlimited	65%	1.0
Sponsor & guarantor	Weak (non-rated sponsor and/or guarantor, no data, no tangible guarantee)	Medium-weak (non-rated to B category-rated sponsor and/or guarantor, limited financial data, weak guarantee)	Medium (BB category-rated sponsor and/or guarantor, audited financial data, neutral tangible guarantee)	Medium-strong (BBB category-rated sponsor and/or guarantor, detailed audited up-to-date financial data, strong tangible guarantee)	Strong (higher than BBB category-rated, detailed up-to-date audited financial data, very strong tangible guarantee)	Strong	1.0
Contractors' quality and procurement method	Weak (contract price not fixed, non-rated contractors and project manager with no track record)	Medium-weak (partially fixed price contract, non-rated to b category-rated contractors and project manager with limited track record)	Medium (partially fixed-price contract, bb category-rated contractors and project manager with limited track record)	Medium-strong (partially fixed-price contract, non-investment grade-rated/neutral contractors and project manager with track record)	Strong (fixed-price contract, investment grade-rated/strong contractors and project manager with extensive track record)	Neutral	3.0
Pre-let (% of total estimated rental income already secured)	≥0% and <20%	≥20% and <40%	≥40% and <60%	≥60% and <80%	≥80% and <100%	45%	3.0
Tenant covenant	Weak (non-rated tenant, less than three-year non-breakable lease)	Medium-weak (rated tenant, 3-5-year non-breakable lease)	Medium (BB category-rated tenant, 5-7-year non-breakable lease)	Medium-strong (low investment grade-rated tenant, 7-10-year non-breakable lease)	Strong (investment grade-rated tenant, equal or longer than 10-year non-breakable lease)	Medium	3.0

Source: Scope Ratings

[21] When relevant, a criteria score is equal to the simple average of its respective sub-criteria.

Our AAA assumptions are calculated as below:

i) AAA time to practical completion: assigned transaction score multiplied by 40% of the remaining scheduled time to practical completion, net of scheduled time contingency;

ii) AAA cost overrun: assigned transaction score multiplied by 25% of the remaining non-procured budgeted capital expenditure costs, net of cost contingency costs; and

iii) AAA non-completed asset liquidation cost: assigned transaction score multiplied by 20%.

Lower rating category assumptions linearly decrease from AAA to C assumption levels, floored at 0. The time to completion overrun to the remaining scheduled time to practical completion, net of scheduled time contingency is capped at 36 months. The cost overrun is capped at 100% of the remaining non-secured budgeted capital expenditure costs, net of cost contingency costs.

The stressed time to practical completion represents a delay of scheduled capital expenditure drawings and of the stabilisation of a CRE asset. Estimated cost overruns net of the debt funded cost contingency will be considered equity-funded and added to the budgeted capital expenditure plan, net of costs already procured. The additional required equity amount will reduce the projected stabilised value and reduce the as-is collateral value.

Our base case gives credit to pre-let agreements, unless the estimated time to practical completion overrun would trigger a tenant termination before the lease commences. We typically consider a construction and refurbishment CRE instrument's fully extended scheduled maturity date if this includes non-discretionary extensions. We may not give credit to these maturity extension options if they are a function of cost or time management milestones that would lead to a capital expenditure draw-stop.

We may give credit to legally robust, unconditional and irrevocable on-demand guarantees of up to 100% of the cost overrun from a rateable guarantor. Cash deposited in an escrow account can substitute for a guarantee, while a haircut may be applied to other types of non-cash collateral. Letters of credit could be another form of support, which we would analyse in detail to determine the degree of their robustness.

Figure 20 to Figure 22 show rating-conditional and score-conditional assumptions for a hypothetical 24-month project with transaction ratings of "1" and "2". Specifically, for such a project with a transaction rating of "2", we consider 6 to 19 months of time overrun (Figure 20), up to 50% of cost overruns (Figure 21) and up to 40% of additional liquidation costs upon default (Figure 22).

Figure 20. Generic estimated time to practical completion overrun (in additional months to the remaining budgeted time to practical completion)

	C	B	BB	BBB	A	AA	AAA
1	0	6	6	6	6	8	10
2	0	6	6	9	12	15	19

Figure 21. Generic estimated cost overruns (in percentage of the remaining non-secured budgeted capital expenditure costs net of cost contingency costs)

	C	B	BB	BBB	A	AA	AAA
1	0	4	8	12	16	20	25
2	0	8	15	24	32	40	50

Figure 22. Generic estimated non-completed asset liquidation costs (in percentage of collateral value)

	C	B	BB	BBB	A	AA	AAA
1	0	3	6	9	13	16	20
2	0	7	12	19	26	32	40

5.3.2 Credit tenant lease

Credit tenant lease (CTL) is a CRE loan secured by CRE asset let to a single tenant under a triple-net lease. CTL usually results from sale-and-leaseback transactions and embeds a tenant call option to purchase or repurchase the CRE at a set price or at market value. The credit risk of CTL is similar to that of a senior secured bond issued by the tenant: tenant creditworthiness determines term default probability and the CRE value determines the recovery rate.

We expect CTL to embed the following factors:

1) Obligor economic exposure and lease agreement - Here, the tenant takes on debt servicing obligations and other economic burdens of ownership. A triple-net lease is signed, covering all costs and expenses related to CRE ownership including taxes, insurance, repair, maintenance and the rental servicing of the CRE loan. We expect the tenant to pay these costs directly without set off or counterclaims.

2) Master lease agreement - Obligors may sublet part of their CRE to third parties. We expect obligors to continue to be fully liable for all lease obligations.

3) Guarantor - Obligors may benefit from parent company guarantees, including for obligations such as timely lease payment. We review guarantee agreements, focusing on waivers of defence or provisions that limit liabilities. A guarantor's credit quality benefits the rating when we consider the guarantee and the recourse to the guarantor to be fully effective.

4) Tenant credit quality - Tenant creditworthiness drives CTL default probability. We assess the creditworthiness of CTL tenants or of their guarantor if a guarantee is likely to be applied.

5) Security package - Securities usually include a first-lien pledge to the secured CRE and the related CRE leases.

6) Insurance - Lease payments must not be interrupted by damage on any part of the leased collateral. We expect the tenant to directly apply collateral and casualty insurance on the CRE. Insurance proceeds should cover repair costs up to its previous fair market value as well as rental loss.

7) Specialised insurance - Insurers have developed policies that specifically cover lease cancellation rights following a casualty or condemnation event, or balloon payment risk at maturity.

8) The lease to contractually end after the debt's maturity.

9) A full or partial amortisation schedule.

5.3.3 Data centre securitisation

Data centres ("DC") are properties that house servers, storage devices, support infrastructure (such as cooling and electrical power systems), and other equipment. DCs are generally owned by the company using it, or by a data centre operator that leases the capacity to end clients.

Key risks in DC securitisations include tenant default risk, re-letting risk, and power constraint. There are three types of DCs, each with different idiosyncratic credit risk characteristics:

1) Enterprise DCs are owned and operated by the same entity: the transaction may benefit from the entity's credit quality and significant investments in the property, but lack tenant diversity and a payment default may arise at the end of the remaining unexpired lease to break if not mitigated;

2) Colocation DCs whereby a DC operator provides the security and support infrastructure to tenants that generally require a small amount of power capacity for a short period of time (one to five years): the transaction generally benefits from a granular tenant base, a generally higher but likely more volatile rental income profile, and a rather short weighted-average unexpired lease to break ("WAULB"); and

3) Hyperscale DCs typically used by a single large-scale entity such as cloud service providers and large internet companies that generally rent a large amount of power capacity (in excess of 30MW) for a long period of time (in excess of 10 years): the transaction is exposed to a single or very few tenants partially mitigated by their strong investment grade credit quality, and a long WAULB. Similarly to enterprise DCs, a payment default may arise at the tenant departure or default if not mitigated.

DCs are operationally intensive assets that require a large amount of power for cooling, ventilation, site management, security, and capacity management. We generally model maintenance capex in line with sponsor forecast if they adequately reflect the properties characteristics. Capex are supportive in reducing the property obsolescence risk. For fully operating facilities, we will consider the power usage effectiveness ("PUE") similarly to the way we assess energy performance of other asset sectors.

Rent is a function of the power capacity allocated irrespective of actual usage. The sector is relatively new with limited historical rental track record. The bespoke nature of the sector, alongside rapidly increasing demand and rising rents means ERV levels are yet to stabilise. In addition to our standard RVH, we would generally embed a terminal rental value haircut in our modelling to reflect a potential drop in demand.

5.3.4 Notes backed by CRE debt funds

CRE funds provide investors with an indirect exposure to CRE. These funds are often investment vehicles in the form of either a real estate investment trust ultimately owned by general and limited partners or a limited company. We highlight below important considerations when assessing debt instruments issued by CRE funds:

Funds' compartments/feeders. Arrangers of CRE funds usually set up dedicated fund compartments or feeders under their umbrella fund to serve different investment strategies or customers. We consider the legal elements in relation to the issuing compartment and assess any additional risks and mitigants introduced by the multi-compartment structure.

Asset manager strategy. Our view on the asset manager affects quantitative parameters and influences our overall assessment of the transaction. To appraise the manager's governance quality and ability to perform under the desired strategy, we divide our analysis into five main parts i) corporate overview; ii) financial strength and business continuity; iii) operations; iv) strategy; and v) track record.[22]

5.3.5 Commercial ground lease

Commercial ground lease ("CGL") transactions are long-term rental agreements in which the tenant (the "lessee") pays ground rent to a freeholder (the "lessor") for the right to develop and/or use a piece of land. Such an agreement grants the lessee the long leasehold right to operate on the site, while the lessor retains the freehold title of the land and receives ground rent in return. CGL transactions are analysed with the same analytical approach as described in this methodology, as the characteristics mentioned below do not give rise to additional risks. The lessee is incentivised to pay the ground rent obligations not only because the initial rent is typically set at a fraction of the property net income, but the economic value of the long leasehold is also substantially more than the value of the freehold land. In addition, the agreement also typically allows the lessee to purchase the freehold land for a peppercorn amount at long leasehold maturity. If the lessee defaults, the lessor has recourse against the land (including the property on top).

The default risk of such transaction is predominantly linked to the credit quality of the lessee that drives its capacity to meet its obligations, together with the property characteristics that support the recovery upon a default. We follow the process described in section 3.2.1 for tenant credit quality assessment but we may conduct a dedicated tenant analysis especially if the underlying property is esoteric in nature (defined by limited number of operators or alternative use) or if the rent roll is very concentrated.

CGL transactions are generally structured with index-linked rents (albeit capped at a 4-5% per annum). As such, property net income will need to increase at a similar pace in order to maintain ground rent serviceability. A mismatch in rates of indexation may lead to higher payment default risk. The risk is partially mitigated if properties have a proven track record of consistently indexed income, such as multi-family residential property assets. We may conduct additional indexation sensitivities to highlight the impact of this risk.

There are predominantly three types of CGL transactions:

1. Direct CGL transaction is the contractual obligation whereby the lessee pays ground rent to the lessor (including purchasing the freehold interest at maturity). Similarly to a structured finance rating that reflects the expected loss

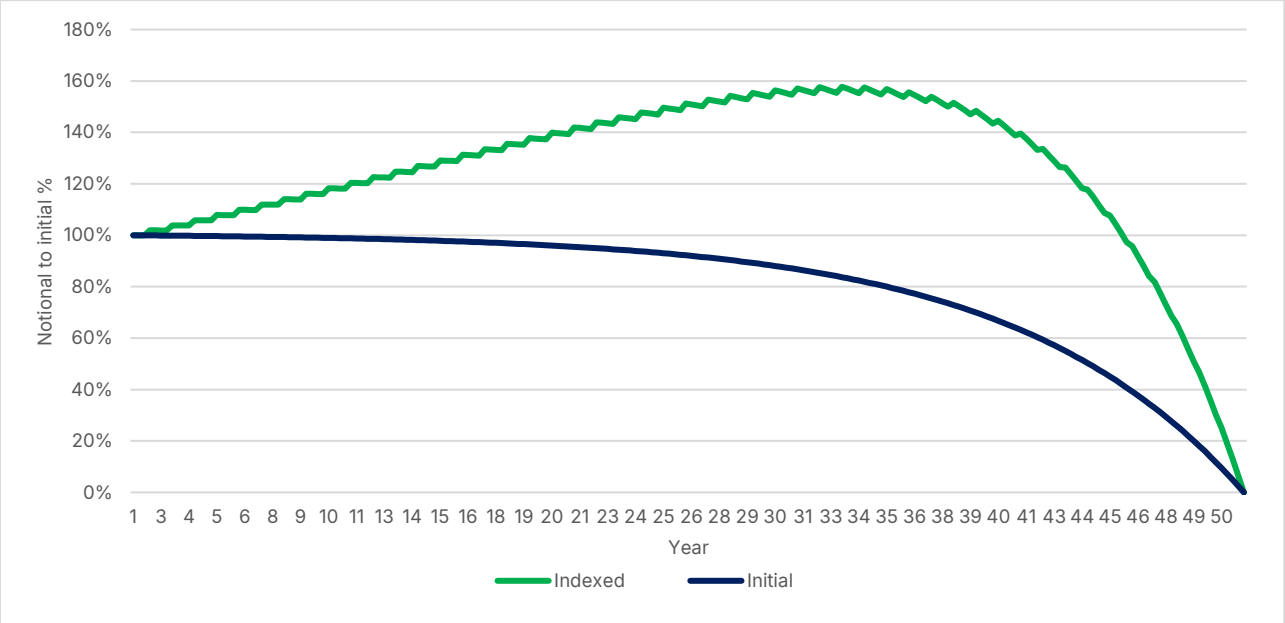
[22] Refer to 'CLO Rating Methodology – Appendix 1 Details of the asset manager analysis' for an analysis on corporate debt and the loan manager.

associated with the coupon and principal payments contractually promised, our rating reflects the expected loss associated with the net present value of future rent payments and the final buy-in outflow at the discount rate based on the internal rate of return set by the valuer at the initial assessment.

2. Indirect CGL transaction is a loan secured against a CGL. The initial CGL rent generally matches the initial fixed instalment (principal and interest due) of the initial loan full amortisation under a French amortisation method. The principal of the facility generally mirrors the CGL's rent indexation, so that the liabilities increase through time with inflation and then rapidly amortise (Figure 23). Scope's rating reflects the expected loss associated with the coupon and indexed principal payments. Most transactions feature excess spread whereby the ground rent is higher than the loan's instalment and a liquidity reserve that mitigate temporary cash flow shortfalls.

3. CMBS CGL transactions is a structured finance transaction secured against a facility that is backed by a CGL. Similarly to back-leverage transactions, the SPV issuing the notes can finance all or a portion of the loan. The higher the portion of the loan financed, the closer the transaction matches an indirect CGL one and its credit risk. The notes are also index-linked to match the loan (and CGL rent) indexation. Similarly to indirect CGL, most transactions feature excess spread and a liquidity reserve to allow payment on the notes and mitigate temporary cash flow shortfalls.

Figure 23. Indirect CGL loan principal amortisation profile



Note: indexation at 2% p.a.

Source: Scope Ratings

5.4 Rating-conditional interest rate assumptions

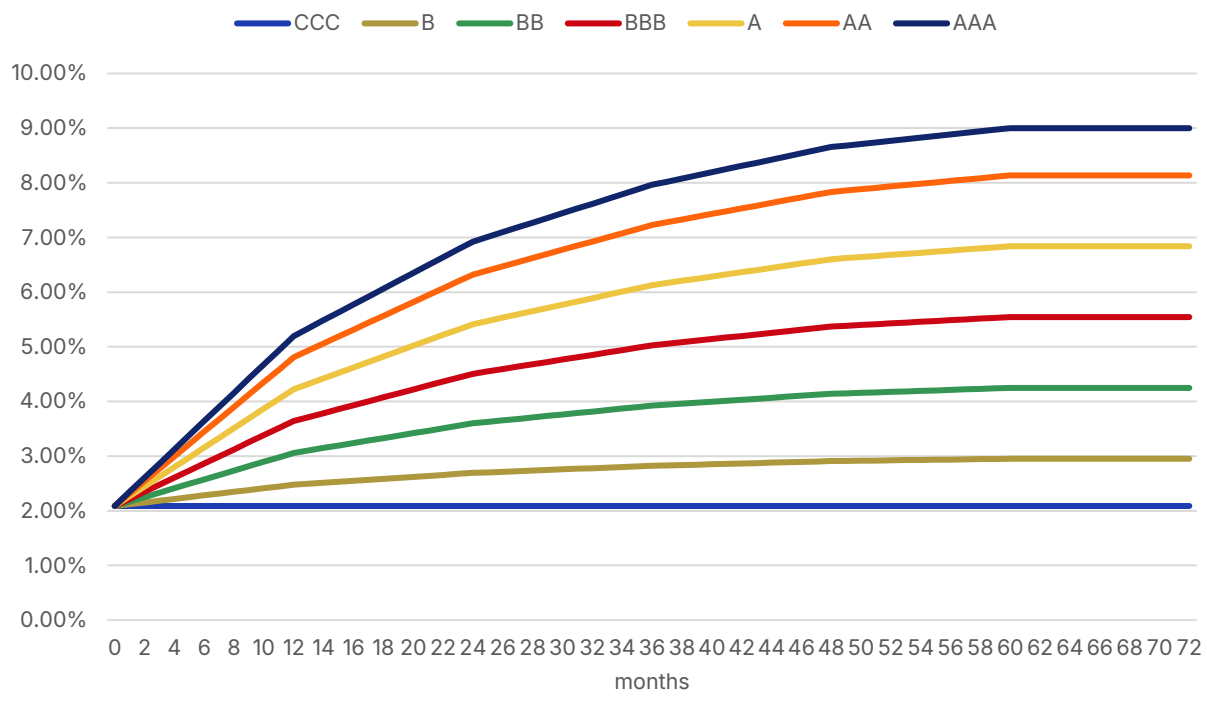
We apply rating-conditional interest rate assumptions to capture fixed-floating risk, i.e. the risk arising where the portfolio pays a fixed rate, whereas the rated instrument pays a floating rate (or vice-versa). In unhedged or only partially hedged structures, fixed-floating risk constitutes the main interest rate risk driver. Although they are typically less relevant, Scope also pays attention to basis risk (where both the portfolio and the notes have a floating rate, but they are linked to different reference rates) and reset risk, and applies transaction-specific stresses, such as a haircut to excess spread, if necessary.

We stress variable reference rates applicable either to the assets or the liabilities by applying rating-conditional interest rate vectors, under an increasing and a decreasing interest rate scenario. Such vectors gradually increase/decrease from the current transaction currency 3-month interbank rate level to a perpetual rating-conditional plateau/floor at the end of year five. For all interest rate tenors of the major western currencies (USD, GBP and EUR), the AAA plateau and floor are fixed at 9.0% and -1.0%, respectively, with a gradual convergence of the plateau and floor levels to the transaction currency 3-month interbank spot rate for lower rating categories. We assume the path to plateau and floor to be frontloaded for all rating scenarios.

In addition to the above stresses, we may also test the current forward rate scenarios as well as alternative interest rate paths that could be more detrimental and may not be fully captured by the above stresses. These additional tests ensure a comprehensive evaluation of the transaction's resilience under adverse and unexpected interest rate environments. The rating committee assesses whether such alternative interest paths correspond to a scenario whose likelihood is consistent with the rating.

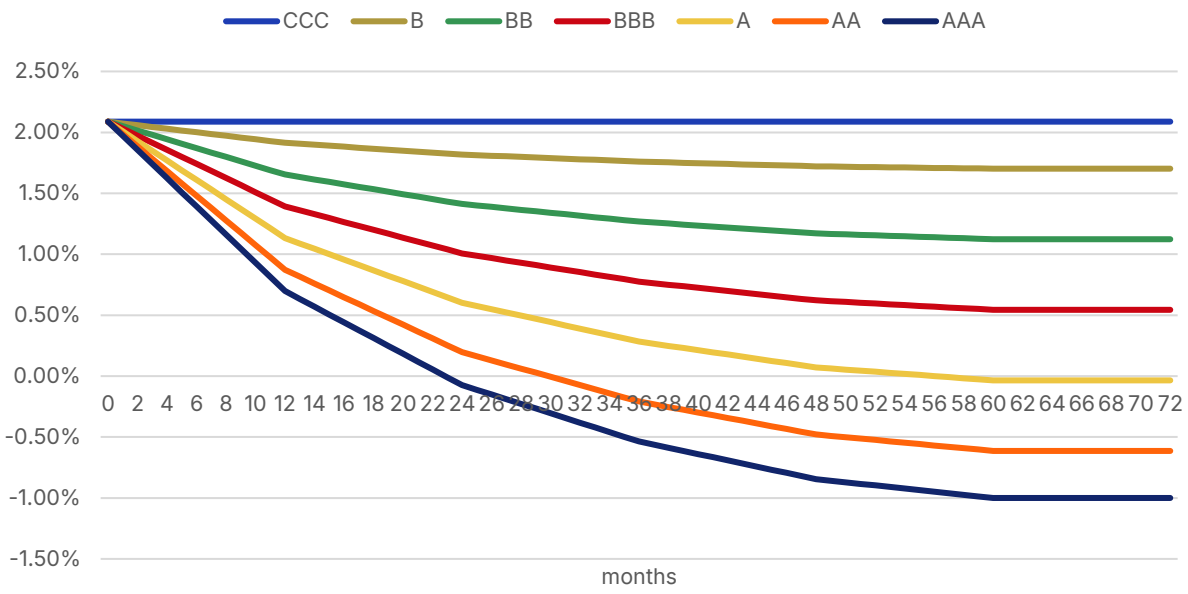
The charts below illustrate the two rating-conditional scenarios for transactions exposed to Euribor fixed-floating risk, as of end of 2025, starting from a spot rate of 2%.

Figure 24. Indicative interest rate stress vectors for rising Euribor rates (end-2025)



Source: Scope Ratings

Figure 25. Indicative interest rate stress vectors for declining Euribor rates (end-2025)



Source: Scope Ratings

5.5 Glossary

Allocated loan amount: The portion of the principal amount of a blanket mortgage associated with each property in the loan.

Appraisal reduction: A new or updated appraisal required following certain events to determine the property value and whether the new value justifies further advances by the master servicer. Once received, an appraisal reduction amount is determined, which is a mathematical calculation comparing the amount of debt, advances and immediate obligations outstanding to the value of the property (typically 90% of the new appraised value) plus any cash collateral (i.e. reserves and escrows). If the property value is below the loan balance including authorised advances, the master servicer may reduce the principal and interest advances it makes on that loan (if it is delinquent).

Available fund cap: the amount of interest payable to class holders limited at the amount of interest accrued on a group or pool of mortgage loan.

Capitalisation rate: used to measure a property's value. The rate is calculated by dividing a property's annual stabilised net operating income by its value.

Commercial real estate collateralised loan obligation (CRE CLO): typically backed by non-recourse senior CRE loans financing non stabilised CRE. The CRE CLO has multiple classes, and the issuer retains the subordinated classes.

Cross-collateralisation: A provision in a mortgage or deed of trust by which the collateral for one mortgage also serves as collateral for other mortgage(s). Thus, should the collateral on the one mortgage fall short in repayment of the debt, the collateral of the other mortgage(s) could be claimed as well.

Cross-default: A provision in a mortgage or deed of trust whereby a breach of terms or a default under the loan documents of one mortgage will automatically trigger the default of the other mortgage(s).

Debt service: Scheduled payments on a loan, including principal, interest and other fees, as required by the loan agreement.

Debt service coverage ratio (DSCR): A property's net operating income or net operating cash flow in relation to the debt service payments on the loan backed by the property.

Debt yield (DY): Net cash flow divided by the outstanding loan balance.

Deferred interest: The shortfall amount when the interest a borrower must pay on a mortgage loan is less than interest due on outstanding principal.

Discount rate: In a discounted cash flow analysis, the rate applied to each year's cash flow from a property to determine the net present value of a series of cash flows.

Escrow account: A deposit jointly held by a borrower and a lender which provides reserved funds for key operating or capital expenses. Typical escrow accounts are held for real estate taxes, insurance, tenant improvement, leasing commissions, necessary structural repairs or environmental remediation, or reserves for replacement.

Excess spread: The difference between the net interest paid on the mortgage loans and the interest accrued on the classes.

Extension option: The period after a mortgage contract's termination granting a borrower more time to repay through refinancing or a sale of the property; or an automatic provision permitting an extension of the original mortgage term.

Foreclosure: A process typically triggered by a delinquency, whereby a lender assumes the title to a property on which the mortgagee has defaulted. A servicer may take over a property from a borrower on behalf of a lender.

Interest coverage ratio (ICR): A property's net operating cash flow in relation to the interest service payments on the loan backed by the property.

Interest-only strip: A class in a CMBS that comprises the aggregate payment stream of all interest from the underlying mortgages(s) due on a certain security that exceeds the coupon paid on the security.

Ground lease: A lease agreement in which the tenant leases only the land from the property owner (freeholder). The tenant has the right to develop, construct, or use the land for a specific purpose. Ownership of the improvements usually reverts to the freeholder at the end of the lease.

Liquidation: The disposal of an asset resulting in its removal from a trust or a lender's portfolio via the sale of a defaulted mortgage loan, the acceptance of a full or discounted payoff, or the sale of the property that previously secured the loan.

Loan-to-value ratio (LTV): The principal amount on a mortgage in relation to the appraised value of the collateral property.

Mezzanine debt: A subordinate loan made after the first-lien mortgage that is secured by an ownership in the borrower instead of by the mortgaged property itself.

Net cash flow: Gross operating revenues earned by a property minus operating expenses, tenant improvement costs, leasing commissions and reserves, but including mortgage payments.

Net operating income: Total revenues earned by a property minus operating expenses but including capital items and debt service.

Operating expenses: Costs associated with the operation and maintenance of an income-producing property. These include real estate taxes, insurance premiums, management fees, utilities, repairs and maintenance and leasing commissions, but exclude capital expenditures and tenant improvement costs.

Overcollateralisation (OC): credit enhancement stemming from excess spread cash collateral and over-collateralised liabilities (higher total assets securitised than outstanding liabilities).

Practical completion: The point at which construction work is certified practically complete as per the building contract. The building contract defines the nature, scope and contractual definitions of the works.

Special servicer: A party in addition to the master servicer that manages loans that go into default and conducts the foreclosure process ('workout').

Tenant improvement costs: Costs generally borne by the landlord towards improving the property. These can include the replacement of carpets, painting, and cleaning.

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