



CRE Loan and CMBS Rating Methodology

Structured Finance

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Contacts

Florent Albert

Senior Director

+49 30 27 891 164

f.albert@scoperatings.com

Mathias Pleissner

Senior Director

+49 69 66 77 389 39

m.pleissner@scoperatings.com

David Bergman

Managing Director

+34 02 30315 838

d.bergman@scoperatings.com

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1. Executive summary

1.1 Introduction and updates

This document provides the latest update to Scope Rating GmbH's (Scope) CRE loan and CMBS Rating Methodology. Besides editorial changes, it provides an alignment of probability of default and expected loss modelling for CRE loan and CMBS transactions with that in our General Structured Finance Rating Methodology; amendments to our all-in refinancing rate framework (see section [2.3.3](#)); the introduction of a scoring framework for determining assumptions and the rateability of construction and refurbishment CRE transactions (see section [4.4](#)). It also contains clarifications regarding i) our inflation assumptions (see section [2.2.2.1](#)); ii) our interest rate risk framework (see section [4.9](#)); and iii) our sensitivity analysis (see section [3.3](#)). Finally, it details updates to i) our liquidity coverage expectations (see section [4.2](#)); ii) illustrative rental value haircuts (see section [4.5](#)); iii) property and vacancy costs (see section [4.6](#)); and iv) capitalisation rates (see section [4.7](#)).

The updates are expected to impact existing CRE loan and CMBS ratings.

1.2 Definitions and applicability

This methodology applies to debt instruments secured by commercial real estate (CRE). This includes direct exposures to CRE loans or securitisations of CRE loans i.e. commercial mortgage-backed securities (CMBSs), collateralised loan obligations (CRE CLOs), asset-backed securities (CRE loan ABSs), CRE debt funds or similar CRE debt structures. In this document, we refer to these jointly as CRE instruments and use CMBSs when referring to specific analytical elements which apply to securitisation only.

The methodology applies to both the initial ratings and the monitoring of granular and non-granular CRE instruments, primarily of income-generating CRE or operational real estate (e.g. hospitality). CRE instruments exposed to assets under construction and refurbishment¹, 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 predominantly applicable to instruments secured by CRE located in Europe but can also be selectively applied to CRE instruments outside of Europe. The methodology does not apply to unsecured debt.

This methodology complements our [General Structured Finance Rating Methodology](#) and should be read in conjunction with our [Counterparty Risk Methodology](#), both available at www.scooperatings.com.

Rating scales and rating definitions are available on www.scooperatings.com.

1.3 Methodology highlights

- **Cornerstone cash flow analysis.** Cash flows of underlying collateral are key in determining the term default risk and the refinancing default risk of CRE loans. Projected cash flows determine the probability of default of CRE instruments, while discounting projected cash flows determines the secured collateral value and, ultimately, the estimated recovery value.
- **Yield-driven refinancing default risk.** The exit debt yield² compared to our estimate of the all-in refinancing rate drives our assessment of refinancing default risk. The all-in refinancing rate is a function of rating-dependent financing conditions, the cost of equity, the expected loss, potential asset- and transaction-specific factors and collateral diversification.
- **No mechanistic caps.** We do not mechanistically limit a transaction's achievable rating based on sovereign, counterparty, tenant or liquidity considerations. We assess the likelihood that credit events associated with these risks will occur, their severity and their marginal contribution to expected loss.
- **Transaction-specific assumptions.** We tailor our assumptions to the asset type, micro 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.

¹ Construction and refurbishment CRE refer to greenfield or brownfield assets financed with a capital expenditure facility.

² 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. Analytical framework

2.1 Methodology summary

2.1.1 Introduction

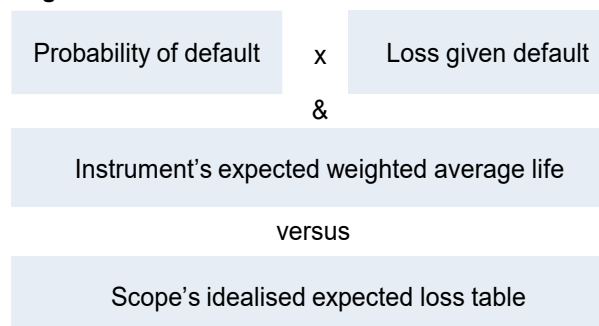
Figure 1 summarises our CRE and CMBS analytical framework. Our analysis centres on an asset's ability to generate cash flow, driven by i) the quality of the sponsor and its business plan; ii) the tenancy profile and rent roll; and iii) the characteristics of the collateral. We complement the analysis by examining a transaction's liability structure: iv) the CRE loan(s) and subsequently v) the CMBSs where applicable. We also incorporate legal, tax and counterparty considerations.

Figure 2 shows our rating framework. We derive the rated instrument's expected loss and the expected weighted average life (WAL) of cash flows generated. We compare the two results to our idealised probability of default and expected loss tables to establish the quantitative assessment. Expected-loss rates reflect the present value of projected interest and principal payments, discounted at the rate promised to investors and divided by the rated instrument's initial value.

Figure 1. Analytical framework summary



Figure 2. Quantitative assessment



2.1.2 Default risk framework

Our analysis of the probability of default on a CRE loan is function of two components:

- i) The probability of a term default, which relates to the borrower's failure to service its contractual interest and principal obligations during the term of the CRE loan.
- ii) The probability of a refinancing default, which relates to the borrower's failure to refinance at CRE loan maturity. We assume a refinancing default if, at maturity, the CRE loan's exit debt yield is lower than our estimate of the all-in refinancing rate of the rated instrument, or if the stressed loan-to-value ratio of the CRE loan exceeds 100% (see [4.8 CRE loan all-in refinancing rate calculation for further details](#)).

2.1.3 Recovery rate framework

We calculate recovery proceeds after foreclosure as the estimated collateral value net of liquidation costs. A maximum recovery applies for CRE loans with a high estimated recovery rate, which is a function of the rating category and the CRE loan-to-value upon default (see [4.10 Foreclosure analysis](#) for further details).

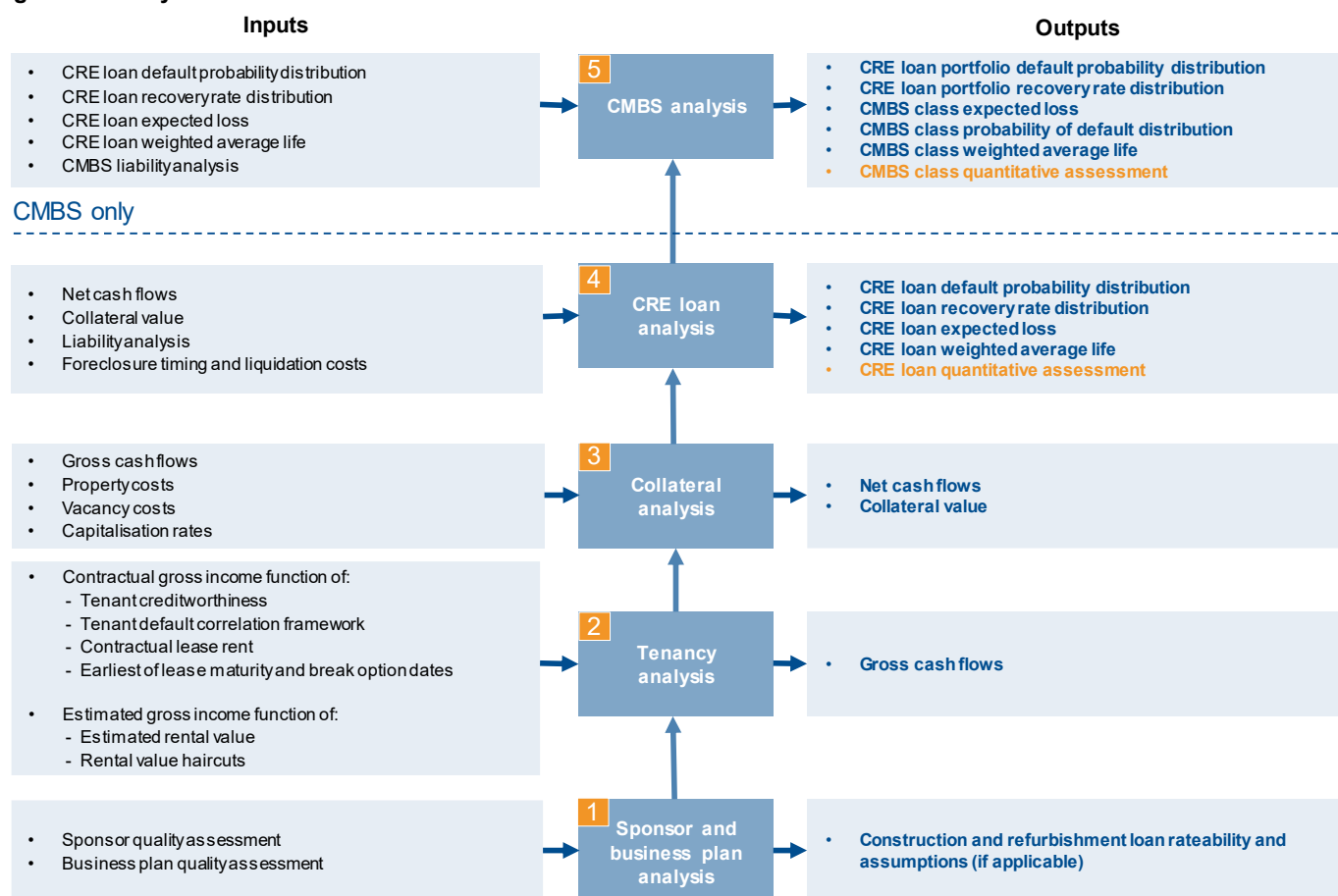
2.1.4 Analytical framework

Figure 3 details our analytical framework, which is based on a bottom-up process of up to five steps:

- 1) **Sponsor and business plan analysis.** We assess the sponsor's quality, willingness and ability to support the transaction and we evaluate the business plan (see [2.2 Sponsor and business plan analysis](#)).
- 2) **Tenancy analysis.** In this step, we determine the expected gross cash flow. This is the sum of: i) the transaction's expected contractual gross income, which is a function of tenant creditworthiness and the contractual lease terms for tenants that are operational; and ii) the rating-conditional estimated gross income of units following a tenant's default or the lease's expiry. We simulate tenant defaults using a Monte Carlo simulation under a tenant default correlation framework (see [2.2.2 Tenancy analysis](#) and [2.2.2.3 Tenant default correlation framework](#) for further details).

- 3) **Collateral analysis.** We calculate the net cash flow and determine the collateral value. The net cash flow is gross cash flow net of property-level, unit-level and vacancy costs. The collateral value is the capitalised net cash flow based on an income valuation approach (see [2.2.3 Collateral analysis](#) for further details).
- 4) **CRE loan analysis.** We analyse the CRE loan's liability structure and determine the CRE loan's expected WAL, default rate and loss rate, which ultimately determines the CRE loan quantitative assessment (see [2.2.4 CRE loan analysis](#) for further details).
- 5) **CMBS analysis.** When applicable, we extend the analysis to CMBSs to determine the probability of default and the recovery rate of the respective classes and, ultimately, each classes' quantitative assessment (see [2.2.5 CMBS analysis](#) for further details).

Figure 3. Analytical framework



2.1.5 Stochastic analytical approach

We use Monte Carlo simulations on tenant defaults to derive the rating-conditional cash flow and collateral value. Our stochastic approach determines the tenant's solvency based on the individual creditworthiness and our tenant default correlation framework (see [Figure 5 CMBS cash flow process](#) for further details).

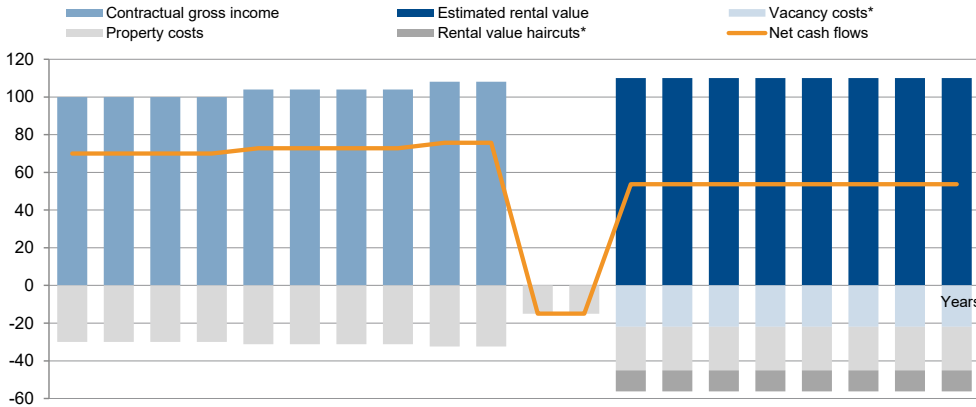
As illustrated in [Figure 4](#), a CRE loan's cash flow is driven by:

- 1) Contractual income prior to tenant default. Contractual income generally expires upon either a tenant's default or the earliest of the lease maturity and the first lease break option.
- 2) The void period when the unit is vacated or the tenant defaults. We apply a rating-conditional re-letting void period.
- 3) Estimated income after the void period. Estimated income is the estimated rental value reduced by rating-conditional stresses applied on i) rental value; ii) property costs; and iii) vacancy costs.

Our analysis determines: i) cash flow over a 10-year rolling period subject to rating-dependent stresses; and ii) cash flow from year 10 in perpetuity, which is not subject to rating-conditional haircuts. The results capture the long-term average rental value expectation for the respective asset.

We calculate cash flows to determine a CRE loan's probability of default either during the term of the loan or at refinancing.

Figure 4. Illustrative multiple units property net cash flow



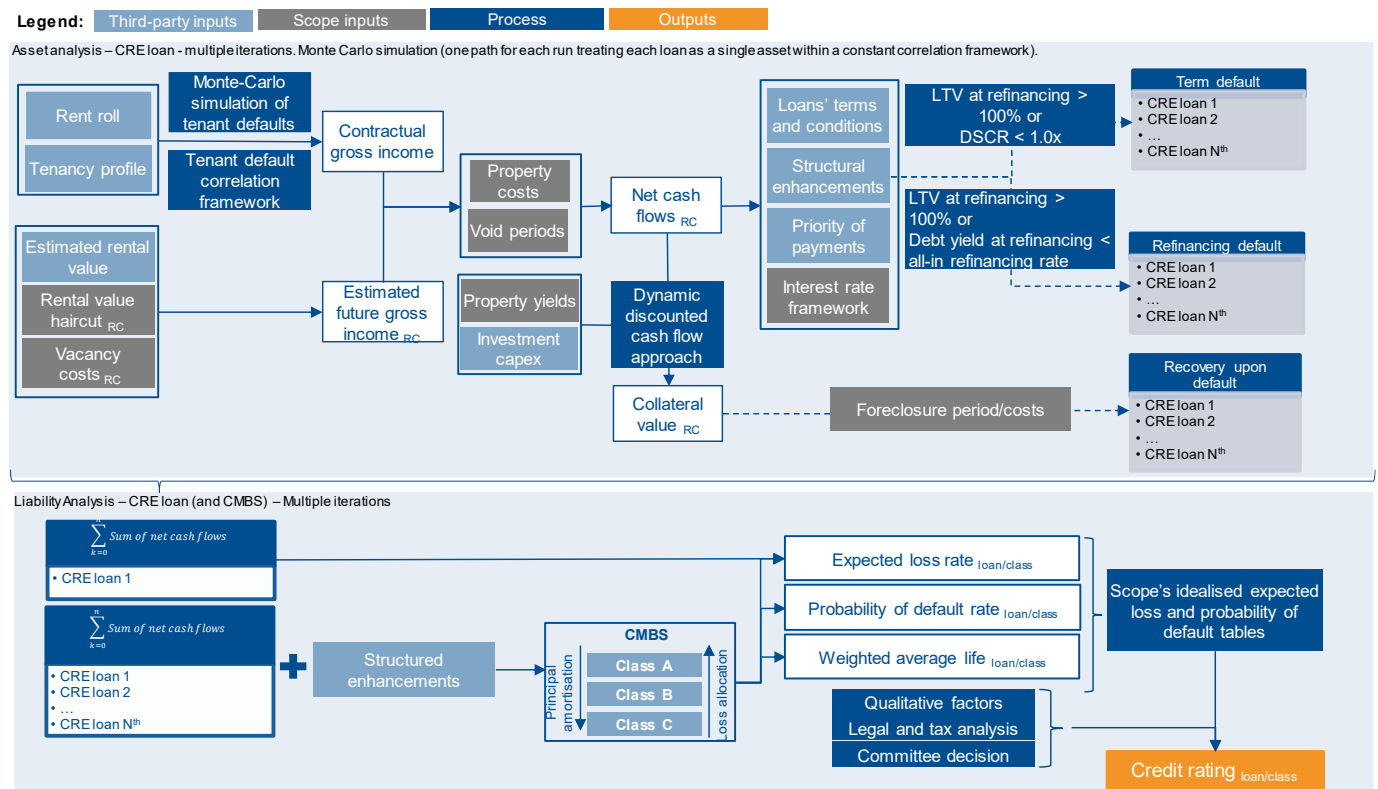
*rating-conditional assumptions

We do not use our stochastic framework for highly granular CRE portfolios like residential assets. Instead, we apply a structural vacancy embedding our rating-conditional void period as well as rental value haircuts to the estimated rental value of the transaction at a specific point in time. However, we may deviate from this approach, for example, when portfolios are exposed to rental seasonality or rental concentration risks.

2.1.6 Cash flow framework

Figure 5 summarises our credit risk analysis framework. We use a bottom-up approach focusing on CRE net cash flows, through five steps performed in the following order: i) contractual gross income analysis; ii) estimated gross income analysis; iii) collateral value analysis; iv) CRE loan structure analysis; and v) CMBS structure analysis if applicable.

Figure 5. CMBS cash flow process



RC: rating-conditional
LTV: loan-to-value
DSCR: debt service coverage ratio

2.2 Detailed framework

2.2.1 Sponsor and business plan analysis

We perform this analysis in two steps. The first consists of a qualitative assessment of the sponsor, examining its likelihood of supporting the transaction and its ability to ensure refinancing. The second is assessing the quality of the business plan (see 4.1 Common real estate financing scheme for further details about key participants in CRE).

2.2.1.1 Sponsor quality

We assess the sponsor's quality based on: i) financial capacity and market position; ii) investment experience and risk management; and iii) willingness to support the transaction.

Our quality assessment of the sponsor forms an input to our scoring framework for construction and refurbishment risks (see 4.4 Construction and refurbishment risks – scoring framework). We may also embed a sponsor's quality in adjustments to a CRE instrument's refinancing rate when a CRE loan is close to maturity.

Our analysis also considers other stakeholders 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.

2.2.1.2 Business plan analysis

2.2.1.2.1 Construction and refurbishment CRE

We rely on a scoring framework to estimate the credit risk of construction and refurbishment CRE³ assets and their associated assumptions. The score reflects our assessment of the credit risks associated with the financing purpose, time contingency, cost contingency, counterparty quality and post-practical completion/refinancing. The score indicates the rateability of a transaction and the rating-conditional simulated development delays, cost overruns and additional liquidation costs. Projects scoring below 2 are typically rateable under this methodology (see 4.4 Construction and refurbishment risks – scoring framework for further details).

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 solvent guarantors, or by income-generating assets. We also look at any timing and cost buffers and contingency plans that allow for unexpected events as well as the priority of disbursement between equity and debt.

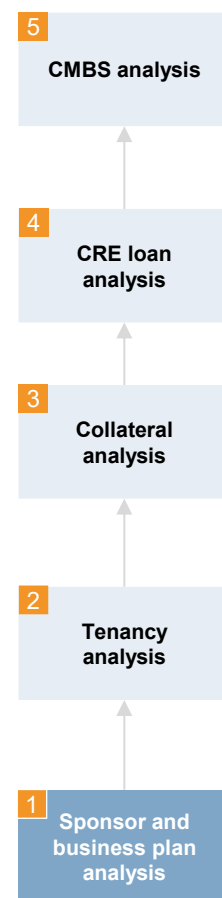
We assume a term default has occurred on a CRE capital expenditure loan if the loan's stressed loan-to-net value is greater than 100%, irrespective of interest reserves available or interest capitalised.

2.2.1.2.2 Transitional CRE⁴

In our cash flow analysis, we adjust estimated rental values provided by either property valuers or sponsors based on our own rental value assessment. We also apply rating-conditional stresses to expected occupancy (i.e. stabilisation delays) that impact default probability and, ultimately, the loss given default.

2.2.1.2.3 Operational real estate

Operational real estate is a real estate investment whose performance is directly linked to the performance of the business conducted on or from the real estate (e.g. hospitality, student accommodation). This methodology refers to income-generating CRE and operational real estate jointly as CRE. We use the term operational real estate when referring to analytical elements that apply specifically to operational real estate.



³ Construction and refurbishment CRE refer to greenfield or brownfield assets financed with a capital expenditure facility.

⁴ Transitional CRE are exposed to non-stabilised income streams subject to repositioning risks, letting risks, cost controlling risks, etc.

2.2.2 Tenancy analysis

Our tenancy analysis estimates gross cash flows consisting of i) contractual gross income followed by a temporary void period after lease termination; and ii) estimated gross income with rental value haircuts applied. Contractual gross income is a function of the rental contract's terms and conditions and the tenant's credit quality.

2.2.2.1 Contractual gross income

Contractual gross income is based on the contractual rent and service charges as long as: i) the lease is yet to reach either the first break option date or maturity; and ii) we deem the tenant to be solvent based on our stochastic analysis.

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

We give credit to contractually agreed rent indexation, considering future annual inflation rates set at long-term average levels⁵. The analysis considers whether short-term or rolling rents are in line with market and historical levels and whether the tenant is operational and not an affiliate of the sponsor.

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 break options on the same date and sound business cases, or for indefinite leases with evergreen break notification periods (e.g. residential leases).

For operational real estate, we estimate gross income based on the sponsor's business plan, and the operator's quality and historical performance.

2.2.2.2 Tenant credit quality

We assign a default probability to each in-tenancy occupant based on its credit quality. We will consider internal and external credit quality assessments including assessments by Scope Ratings or its affiliates, public ratings by regulated and supervised credit rating agencies, and/or rankings by third-party credit assessment providers, adjusted when necessary.

When no such rating or assessment is available, we perform a credit quality assessment based on available data on comparable benchmarks. This includes an estimated average credit quality on small and medium-sized enterprises (SMEs) based on historical values in the respective countries. Probabilities of default for Western European SMEs tend to be commensurate with non-investment grade ratings.

We complement our analysis by testing the sensitivity of the CRE instrument's expected loss to various tenant credit quality assumptions (see [3.1 Rating sensitivity](#) for further details).

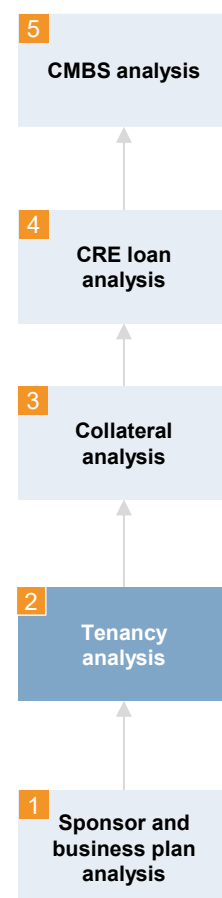
We may conduct a dedicated tenant analysis for CRE instruments that are highly dependent on one tenant or a few tenants (i.e. anchor tenants), particularly for CRE loans that are credit-linked to the lease agreements (see [4.13 Credit tenant lease](#) for further details).

We do not assess individual tenant quality for highly diversified CRE tenancies (e.g. in residential properties).

For operational real estate, we assess the credit quality of the operator instead of the credit quality of the underlying tenants.

2.2.2.3 Tenant default correlation framework

Figure 6 exhibits our pair-wise tenant default correlation framework for creating tenant default dependencies. We use the weights attributed to each of the four factors as shown below to determine the interdependence among tenants, which we use to determine the portfolio's tenant default-rate distribution⁶.



⁵ We consider a 2.0% annual inflation rate in Western Europe.

⁶ Factors are defined as the square root of the respective correlation parameters.

We may adjust the correlation framework or its components 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 parameters below.

Figure 6. Indicative correlation parameters for a diversified CRE loan⁷

Market risk factor	Parameter	Objective
Global	2.0%	Common dependency on macroeconomic shocks
Asset location (macro – country)	5.0%	Common dependency on domestic economic and political developments
Asset location (micro – region/city)	10.0%	Common dependency on local economic and political developments
Tenant industry	10.0%	Common dependency on business cycles and sector outlooks

2.2.2.4 Estimated gross income

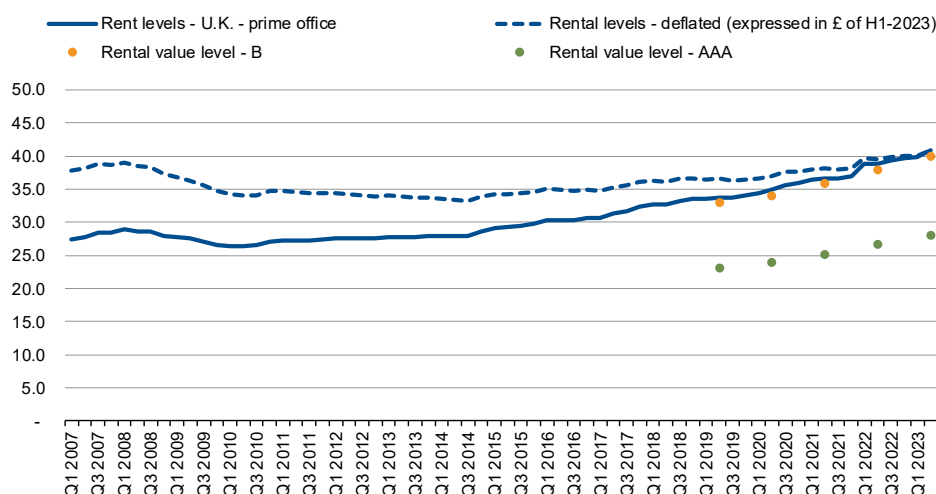
A unit's void period starts once contractual gross income is no longer available. Units generate no income during this time. We calculate gross income following the void period by applying haircuts to estimated rental values.

Our estimates of rental value and service charges are based on information provided by recognised valuers. We adjust the valuer's estimated rental value if it differs significantly from our expectations derived from third-party research or rental benchmarks.

2.2.2.5 Rental value haircut

Our rental value haircut (RVH) is a function of: i) the property's macro and micro locations and condition relative to the market; ii) the asset type; and iii) the rating category (see [Figure 15 Illustrative RVHs](#) for further details). We ideally use valuer data featuring at least one economic cycle.

Figure 7. UK prime office rent vs our rental value levels



We determine a B rating-conditional RVH by taking recent market rent plus a volatility buffer equal to half a standard deviation of the annual deflated rental change over a six-month period. Our AAA rating-conditional RVH reflects the highest stresses related to a long recession with continuously falling rents. RVH_{AAA} is based on a three-year downturn with rents falling at three times their historical annual standard deviation, with the floor set at the average volatility of the relevant jurisdictions⁸. In exceptional cases, we adjust the multiplier to the standard deviation if the rental volatility in the observed period differs significantly from average observations. We apply a linear interpolation between RVH_B and RVH_{AAA} . Our RVH_C , RVH_{CC} and RVH_{CCC} , RVH_B - notch-specific RVHs are extrapolated from the linear interpolation between our B and AAA levels and apply a zero floor.

⁷ We typically use the same 'industry mapping' as in the [SME ABS Rating Methodology](#).

⁸ For certain jurisdictions and asset types, rental value changes in recent history were benign. We address this characteristic by applying a volatility floor using peer average volatility.

2.2.3 Collateral analysis

Our collateral analysis is based on the gross rental income derived from our tenancy analysis and results in: i) net cash flows; and ii) the collateral value.

Net cash flows are a function of gross rental income minus property-level, unit-level and vacancy costs.

The collateral value follows an income valuation approach. The collateral value equals the rating-conditional net cash flows capitalised at rating-conditional discount rates plus the terminal value (see [2.2.3.4 Collateral value](#) for further details). The discount rate is typically the implied capitalisation rate plus our long-term average annual inflation rate assumption. This methodology refers to these jointly as capitalisation rates.

We apply different capitalisation rates to reflect the different risk profiles both before and after a CRE asset has stabilised.

The terminal value follows the Gordon Growth Model (see [2.2.3.4 Collateral value](#) for further details). Net cash flows we deem sustainable are capitalised at a rating-conditional capitalisation rate, net of our long-term average annual inflation rate assumption.

Sustainable rental cash flows reflect a rating-independent, sustainable and through-the-cycle rental level. We may apply a sustainable RVH to expected rents, to normalise rental levels to a deflated, long-term average and embed our long-term view in asset-type-specific rental levels when appropriate.

2.2.3.1 Property costs

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

Non-recoverable operating costs generally include real estate taxes, insurance and utility expenses. They depend on the lease and asset types and are determined based on valuation reports, lease agreements or our benchmarks. For vacant units, we apply either a floor on operating costs at 30% of full-occupancy operating costs including recoverable expenses, or vacancy costs as a function of lettable area.

Maintenance capital expenditures are generally based on the latest collateral valuations and technical due diligence reports. We estimate higher expenditures if we deem budgeted maintenance capital expenditure to be insufficient.

Management, letting and tenant improvement costs are a function of the relevant contractual agreements as well as our benchmarks (see [4.6 Illustrative ranges of property and vacancy costs](#) for further details).

2.2.3.2 Vacancy costs

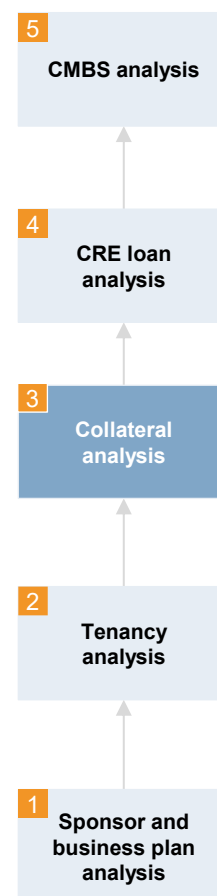
CRE vacancy costs are: i) structural; or ii) temporary (void periods).

Temporary and structural vacancies, which are inputs into our collateral value calculation, reduce net cash flows over a property's life. Void periods limit rental income after the initial lease ends, or the tenant has defaulted. A structural vacancy, by contrast, reflects a vacancy that structurally limits a property's occupied area in its respective market and during subsequent void periods after a unit is relet.

The structural vacancy reflects a through-the-cycle rate that is a function of: i) the location; and ii) the property type. Void periods reflect the temporary vacancy, which is a function of: i) the property type; ii) the location; and iii) rating category (see [4.6 Illustrative ranges of property and vacancy costs](#) for further details).

We may adjust the structural vacancy rate to account for actual vacancies, lease concentration risk, insufficient capital expenditure, flexible lease contracts, and fundamental changes to the asset type. We assume units with prolonged vacancies to remain vacant unless we derive comfort from an asset-management strategy applied (e.g. substantial capital expenditure undertaken).

Void periods reflect temporary vacancies following a lease discontinuation event. They represent a reletting period that includes the marketing period and a rent-free period. They significantly alter available cash flows for concentrated tenancy bases but have less of an impact for highly diversified tenancy bases. B stresses are anchored at the current market level and include our short- to medium-term expectations. We generally derive stress levels using the same method as for our rating-dependent rental value



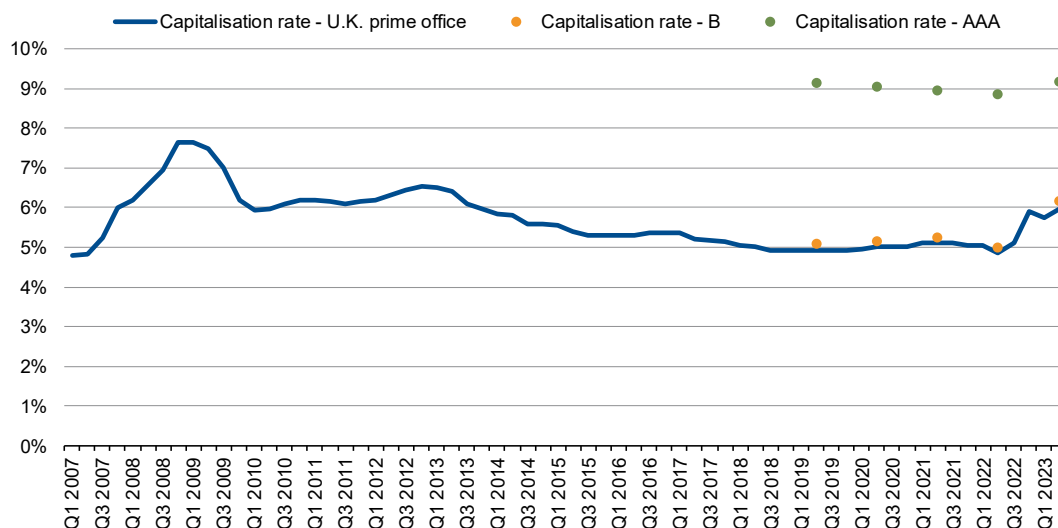
haircuts and capitalisation rates. If data is unavailable, we use our void period benchmarks (see 4.6 Illustrative ranges of property and vacancy costs for further details).

2.2.3.3 Capitalisation rates

Capitalisation rates are a function of: i) the macro/micro location; ii) the asset type and asset quality; and iii) the rating category. (see 4.7 Illustrative capitalisation rates for further details).

We generally derive the B rating-conditional capitalisation rate using the latest market level of the capitalisation rate plus a volatility buffer equal to half a standard deviation of the annual capitalisation rate change over a six-month period. The AAA capitalisation rate reflects a three-year downturn with the average of through-the-cycle minimum and maximum capitalisation rates rising at three times their historical annual standard deviation (with a floor based on the average volatility of comparable jurisdictions⁹ and a minimum distance of 50% to the actual capitalisation rate). We adjust the multiplier to the standard deviation if capitalisation rate volatility in the observed period differs significantly from average observations. We apply a linear interpolation between B and AAA capitalisation rates for the other rating levels. Our CapitalisationRates_C, CapitalisationRates_{CC}, CapitalisationRates_{CCC} and CapitalisationRates_B capitalisation rates have a floor at the B level.

Figure 8. Observed UK prime office capitalisation rates and our associated capitalisation rates



2.2.3.4 Collateral value

The collateral value is calculated using the formula below.

$$Collateral\ value = \sum_{i=1}^{10} \left(\frac{Net\ cashflow_i}{(1 + discount\ rate)^i} \right) + \frac{1}{(1 + discount\ rate)^{10}} \cdot \frac{Sustainable\ net\ cash\ flow}{exit\ capitalisation\ rate}$$

where exit capitalisation rate equals the discount rate minus our annual inflation rate assumption. The discount rate is typically the capitalisation rate plus our annual inflation rate assumptions. We may deviate from this relation when we expect the CRE asset's credit risk profile to change over the next 10 years (e.g. stabilisation period, lease maturity risks).

⁹ For certain jurisdictions and asset types, recent changes in capitalisation rates were benign. We address this characteristic by applying a floor to volatility based on the peer average volatility.

2.2.4 CRE loan analysis

2.2.4.1 Rating framework

Our rating reflects a CRE loan's expected-loss and probability-of-default rates, and its expected WAL based on cash flows generated. The distribution of the expected-loss rate is a function of the default probability distribution – over the loan term or at refinancing – and the recovery rate upon default.

In our stochastic analytical framework, we run rating scenarios with several iterations determining the solvency of each tenant and borrower in each period over the term. We test the CRE loan's term default probability and refinancing default probability for each iteration of a rating scenario.

We derive the probability of default, expected loss and WAL based on the multiple iterations. The three values are compared to our idealised probability of default and expected-loss tables¹⁰ and provide a quantitative rating outcome for the CRE loan. We apply a degree of tolerance between our probability of default outputs and our expected loss outputs as defined in our General Structured Finance Methodology¹¹.

2.2.4.1.1.1 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. We do not quantitatively consider default covenants. This is because we believe that when default covenants are breached but cash flows remain sustainable, consensual solutions remain more likely than liquidation. We also assume a term default has occurred if the stressed loan-to-net value of a construction or refurbishment CRE loan exceeds 100% at any point in time.

2.2.4.1.1.2 Refinancing default probability

We define a CRE loan refinancing default as when the loan's debt yield at maturity is lower than our estimated all-in refinancing rate of the rated instrument, or when the stressed loan-to-value of the CRE loan exceeds 100%.

Our transaction-specific all-in refinancing rate is a function of: i) the debt funding rate; ii) the cost of equity; iii) the risk premium; iv) any CRE instrument refinancing rate adjustment; and v) the collateral diversification discount rate (see [4.8 CRE loan all-in refinancing rate calculation](#) for further details).

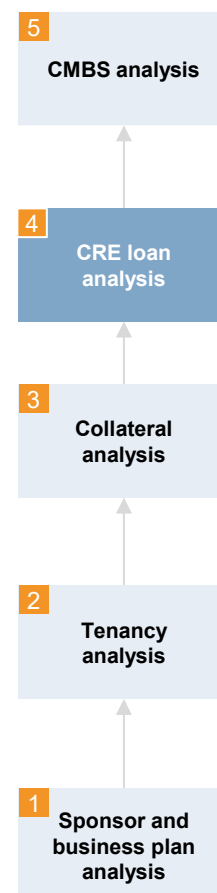
We closely monitor a sponsor's refinancing strategy. This analysis also factors in our assessment of the proposed refinancing plan. We expect to receive refinancing plans well in advance of the CRE loan's maturity, typically 6-12 months before. We expect such plans to include up-to-date asset information, evidence of discussions with prospective lenders and the proposed refinancing terms and conditions. We may adjust a rating downwards if information is still not provided six months before a CRE loan's maturity. If the CRE instrument is restructured, we evaluate whether executed contractual changes constitute a default under our credit rating definitions¹².

2.2.4.2 Recovery rate

We determine an effective collateral liquidation value upon default considering: i) foreclosure timing; ii) foreclosure and liquidation costs; and iii) a maximum recovery rate.

Foreclosure and liquidation costs are based on servicing agreements or internal benchmark assumptions. The maximum recovery rate is a function of i) the CRE loan-to-value upon liquidation; and ii) the rating category stress.

We estimate maximum recovery proceeds after a foreclosure period to be equal to the estimated collateral value net of liquidation costs. We apply a maximum recovery for CRE loans with exceptional recovery rates (see [4.10 Foreclosure analysis](#) for further details).



¹⁰ Please refer to [Scope Ratings Idealised Tables](#) for more details

¹¹ See [General Structured Finance Rating Methodology](#) Appendix IV of for further details.

¹² See Scope's [Credit Ratings Definitions](#) for further details.

2.2.4.2.1 Foreclosure process

We assume a recovery upon default following a foreclosure period. We usually expect the secured collateral to continue servicing the debt¹³ including any interest penalty upon default.

2.2.4.2.2 Foreclosure costs and liquidation costs

Foreclosure costs are a function of information in the foreclosure agreements or our assumptions if these are unavailable.

Liquidation costs are function of: i) the asset's jurisdiction; ii) the asset type; iii) the CRE loan's size and complexity; iv) existing hedging agreements; and v) transaction type.

2.2.4.2.3 Maximum recovery rate

We calculate the maximum rating-conditional recovery rate upon default based on the CRE loan-to-value at liquidation. We only deviate from this approach if transaction features warrant it, for example, a collateral value with a floor, or a forward sale with a locked price.

2.2.5 CMBS analysis

2.2.5.1 Expected-loss rating framework

Our CMBS class ratings are a function of a CMBS's expected-loss and probability of default rate together with an expected WAL based on cash flows generated. The CMBS expected-loss rate distribution is a function of the CRE loan cash flow analysis.

2.2.5.2 Default probability distribution

We consider a CMBS class default to occur when the issuer fails to service relevant class interest or principal obligations. We do not quantitatively consider CMBS class default covenants. This is because CMBS are securitisations of non-recourse CRE loans, which means liquidations are less likely than a consensual solution if default covenants are breached.

In our stochastic analytical framework, we run rating scenarios with several iterations determining tenants' solvency within each secured CRE over its term. We test the term default probability and refinancing default probability of securitised CRE loans for each iteration of a rating scenario. We allocate net cash flows and principal proceeds of a securitised CRE loan net of special servicing costs and liquidation costs to the CMBS class as per the priority of payments.

2.2.5.3 Recovery rate

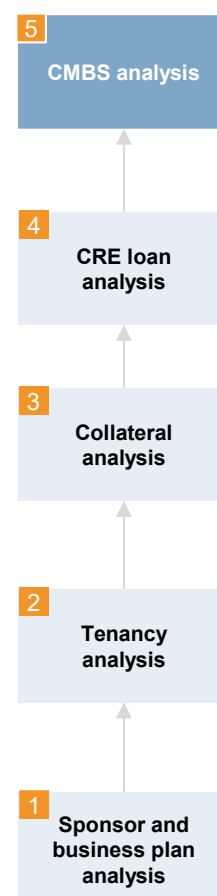
CMBS recovery equals the effective recovery proceeds of the underlying CRE loan net of special servicing costs and liquidation costs.

2.2.5.4 Asset analysis (CRE loans)

Our CMBS asset analysis follows the CRE loan analysis framework. The level of analytical detail required for each CRE loan depends on the CRE loan concentration.

We perform a line-by-line securitised CRE loan analysis for a CMBS secured by a CRE loan portfolio whose inverse value of the CRE loan Herfindahl index is 15 or below. We perform a portfolio approach when the CRE loan Herfindahl index is higher than 50¹⁴. We apply the most appropriate of the two approaches when the CMBS falls outside of the above categories (e.g. medium-granular CMBS). The inverse of the Herfindahl score is calculated as

$$\sum_{k=1}^{n=\text{number of CRE loan}} \frac{1}{\left(\frac{\text{Loan balance}}{\text{Total securitised balance}}\right)^2}$$



¹³ We partially or fully disregard debt servicing upon default for owner-occupied or partially owner-occupied CRE.

¹⁴ See [General Structured Finance Rating Methodology](#) for further details.

2.2.5.5 Liability analysis

We assess CMBS liabilities using our CRE loan analysis framework together with an assessment of CMBS-specific characteristics as described below.

2.2.5.6 Ramp-up and replenishment

A CMBS may embed a ramp-up or reinvestment period. During this time, the collateral manager can use principal proceeds from committed and undrawn class principal, scheduled loan amortisation or loan prepayments to buy additional loans, whether these are pre-identified or not. 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. We assess the credit quality of the initial portfolio as well as an expected portfolio post-ramp-up/reinvestment maturity date. We may assume that portfolio performance will deteriorate up to the investment guideline limits.

2.2.5.7 CMBS protection tests

We quantitatively consider non-default financial CMBS covenants that we deem effective and non-discretionary. 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 a reduction in liabilities, add credit enhancement for senior classes and, in some instances, prevent reinvestment in new collateral interest.

2.2.5.8 Collateral manager, servicer and special servicer analysis

CMBSs rely on collateral managers and/or loan servicers to oversee and manage loan servicing and on special servicers to manage any distressed CRE loans. We may perform operational reviews to assess stakeholders' quality, experience, operating schemes and authorised activities as per the servicing agreement. We review their authorised activities, which include the selection of eligible loans during the ramp-up or replenishment period, the disposal of credit-impaired and defaulted loans, the modification of loans and the workout of impaired loans. We adjust our assumptions on servicing fees, recovery timing and recovery levels if our reviews reveal weaknesses in the track record, processes or alignment of interests¹⁵.

2.2.5.9 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 measures to prevent credit-quality migration, including interest coverage ratio¹⁶ and overcollateralisation¹⁷ test maintenance, minimum loan-to-value¹⁸ levels, loan eligibility criteria and limits to the number of loan modifications. We assess the credit impact of modified loan portfolios as part of our sensitivity analysis.

2.2.5.10 Exchange of default or impaired loans

CMBS collateral managers or special servicers can buy out, subject to conditions, defaulted or impaired loans from the securitised pool to work out distressed assets privately while preventing a complex work-out involving class holders. We assess the conditions of exchange including the existence of a maintenance or improvement of note protection test and value disposal limits.

2.2.5.11 CRE loan prepayments

Our base case usually assumes that loans will not prepaid ahead of their scheduled maturity including non-discretionary extensions. For multi-loan CMBS, we perform a sensitivity analysis based on loan prepayment scenarios.

2.2.5.12 Synthetic transactions

Our synthetic CMBS class ratings reflect the risk that the credit protection seller will make payments with respect to credit events under the terms of the CMBS credit protection deed. We focus on the loss determination and loss allocation mechanisms following a credit event of default. Unfunded synthetic transactions are also less exposed to counterparty risks such as with the account bank or liquidity provider.

¹⁵ See [Counterparty Risk Methodology](#) for further details.

¹⁶ 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.

¹⁷ Calculated as the secured collateral value over its outstanding debt principal balance.

¹⁸ Calculated as the outstanding CRE loan principal balance over its secured collateral value.

2.2.6 Counterparty risk analysis

Our evaluation of counterparty exposures relies on our [Counterparty Risk Methodology](#).

2.2.7 Legal and tax analysis

We review available legal and tax documentation and opinions and consider credit-linked legal aspects as per our [General Structured Finance Rating Methodology](#). We expect opinions to strongly express the following: i) borrowers are duly incorporated and validly exist; ii) the documentation reflects valid, legally binding and enforceable obligations of the parties and their capacity and authorisation to execute the documentation; iii) the perfection and effectiveness of the SPV's bankruptcy remoteness and asset transfer; and iv) tax implications and the perfection of the security interest and asset enforceability.

We expect legal documentation to conform to Loan Market Association standards.

3. Complementary analysis

3.1 Integration of ESG factors

Our credit analysis integrates environmental, social and governance (ESG) factors. We incorporate the risks arising from a transaction's exposure to ESG factors based on the analytical approach detailed in this methodology (see [4.14 Environmental, social and governance \(ESG\)](#) for further details).

3.2 Data adequacy, data guidelines and portfolio data template

We can provide our CRE loan and CMBS multi-layered excel input data template via our CRE loan and CMBS scorecard¹⁹. We also welcome originator/sponsor data templates and can generally process any standard format (Excel and database formats are preferred for quantitative data).

For CMBSs, we expect reports on agreed-upon procedures to be performed by reputable and independent auditors and to 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 (see [4.15 CRE loan and CMBS data guidelines](#)).

While our credit risk analysis provides some flexibility, conservative assumptions are required if information is not in line with expectations.

3.3 Rating sensitivity analysis

We test the resilience of the credit analysis based on information available until closing.

This sensitivity analysis has the sole purpose of assessing the sensitivity of our credit analysis levels to input assumptions and is not indicative of expected or likely scenarios²⁰. We perform further sensitivity analysis relevant for each credit analysis according to its characteristics.

Figure 9. Sensitivity tests²¹

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

¹⁹ See [Scope Credit Scorecard for CRE loan and CMBS](#) for further details.

²⁰ See [General Structured Finance Rating Methodology](#) for further details.

²¹ In addition to the sensitivities disclosed in our [General Structured Finance Rating Methodology](#).



CRE Loan and CMBS Rating Methodology

Structured Finance

3.4 Monitoring

Ratings are reviewed at least once a year or more frequently if warranted by events.

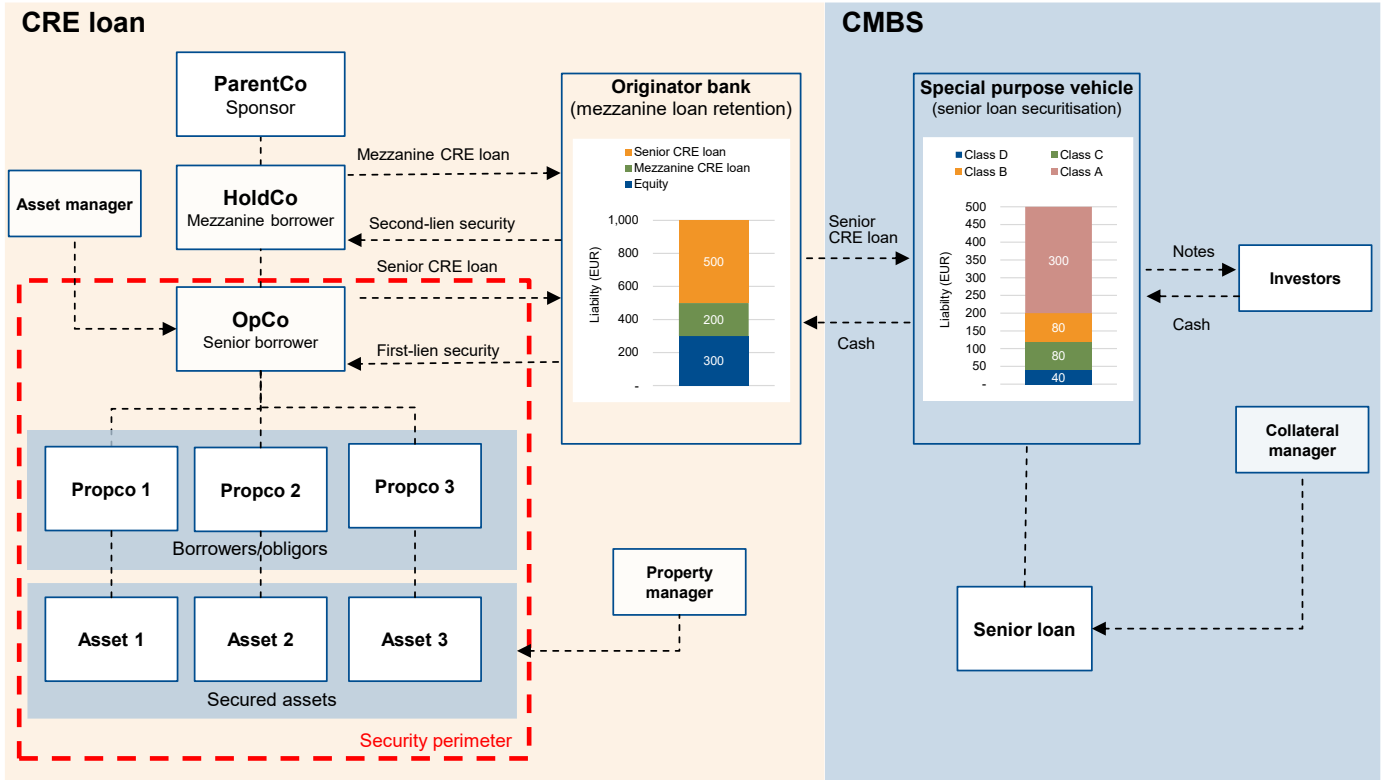
We expect to receive timely monitoring information, including payment date and management reports, compliance certificates, up-to-date business and capital expenditure plans, up-to-date CRE valuations and rental schedules (see [4.15 CRE loan and CMBS data guidelines](#) for further details).

CRE is an operationally intensive and dynamic asset class. Material changes in the composition of a CRE portfolio or the structure of a CRE loan are common. We are sometimes asked to provide a rating agency confirmation, which is an analytical review that determines whether specific changes in the transaction's documentation affect the instrument's rating.

We continuously monitor our assumptions and review them thoroughly at least once a year, or more frequently if warranted by market events.

4. Appendix

4.1 Common real estate financing scheme



4.2 Liability analysis and structural features

We quantitatively consider structural features for CRE loans, complemented by an analysis of securitisation structural features for CMBS when possible. We assess them qualitatively when the quantitative analysis cannot capture those features.

CRE loans

Priority of payments. We allocate interest and principal proceeds as well as losses on the relevant rated instruments in line with the priority of payments.

Interest. We consider interest on drawn principal, commitment fees on undrawn principal, as well as step-up interest and default interest.

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. We calculate the exit CRE loan-to-value and debt yield on a CRE loan based on the total outstanding liability for whole loans and A/B loans and on the specific class for senior/mezzanine loans.

Dual recourse. Dual recourse refers to CRE loans for which a junior creditor has legal recourse to cure a senior event of default. It provides an effective second cure recourse since a capable junior creditor will not want a senior creditor to enforce the senior CRE loan because it risks diluting the junior value. We give credit to such a mechanism if i) interests are aligned; ii) the junior creditor has good creditworthiness; and iii) we deem the mechanism effective under our legal documentation analysis.

Interest-rate risk. CRE instruments are exposed to i) interest-rate risk arising from the mismatch between fixed-rate assets and floating-rate liabilities; or ii) term structure risks from the different interest-rate reset dates between the underlying CRE loans and the CMBS liabilities. We assess the rated instrument for both risks, any mitigants and the effectiveness of these mitigants by applying rating-conditional interest-rate stresses (see [4.9 Interest rate framework](#) for further details). We review derivative agreements in terms of their terms and conditions, rating triggers, substitution rights and costs. We may also determine hedge break costs by considering recoveries net of super senior liability costs. We expect highly rated instruments (AA or above) to be fully hedged against interest-rate risk, foreign-currency risk and basis-rate risk.

Foreign-exchange risk. CRE loans are exposed to foreign-exchange risks if assets are located in jurisdictions with different currencies or if assets and liabilities are denominated in different currencies. We assess the CRE loan's foreign-exchange risk, any mitigants and the effectiveness of these mitigants by applying rating-conditional foreign-exchange stresses. Natural hedges (e.g. multicurrency CRE loans secured by CRE denominated in the respective local currencies) are imperfect if the security is enforced or liquidated into another currency to service the debt.

Senior expenses. We consider that head leases, taxes and counterparty senior expenses rank senior to rated debt instruments. The transaction's legal documentation generally defines senior expenses. Examples are fees paid to the 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.

Extension option. We calculate an expected loss over the entire scheduled lending period including extension periods with clear and non-discretionary extension covenants. We also assume that any extension on the term of a CRE loan is subject to the renewal of initial structural protections. We may consider a different strike rate than the initial rate when the interest rate hedging strike rate on a CRE instrument will be reset at the extension option date.

Covenants. CRE loans feature covenants that are negative (which prevent certain actions) and/or positive (which require certain actions). Our quantitative analysis only incorporates financial non-default covenants that we deem effective. We qualitatively consider other covenants.

First-loss reserve funds. These provide additional credit enhancement by providing extra cash to cover any future losses. We review how they are funded²², whether they are pre-funded or guaranteed, how they are triggered, their loss-coverage ratio, and which instruments benefit from them.

²² See Scope's [Counterparty Risk Methodology](#) for further details.

Cure mechanisms. CRE sponsors or lenders can cure underperforming CRE loans via prepayment, extra collateral or discretionary equity injections. We consider cure mechanisms only qualitatively, unless sponsors or lenders are committed to providing them, which we assess based on legal and historical evidence.

Coupon conditions. Our quantitative analysis only considers non-discretionary coupon step-down/up triggers that are legally and clearly documented. We assess the rating feasibility of coupon mechanisms with unclear legal clauses or discretionary deferral mechanisms.

Insurances and guarantees. We review insurance and guarantees covering cash flow disruptions from unexpected events. We expect coverage of force majeure risks (e.g. natural disasters, explosions, floods, earthquakes, windstorms, vandalism and terrorism), loss of rent and replacement value. We may adjust our assumptions for uninsured or partially insured risks and highlight them in our ESG analysis section.

ESG principles. Our overall credit risk approach includes ESG metrics and performance. We may adjust our assumptions if needed (see 4.14 [Environmental, social and governance \(ESG\)](#) for further details).

CRE portfolio disposal strategy. The sponsor or asset manager's business plan determines the portfolio disposal strategy, which relies on assumptions around asset valuation and the time of disposal. The disposal profile is generally driven by metrics including allocated loan amounts (i.e. percentage thereof), loan-to-cost²³ and loan-to-value. The business plan disposal profile usually forms our base case. We stress the value of assets to be disposed of and their expected time of disposal. We derive stressed portfolio disposal profiles based on our assumptions and the financial covenants mentioned above.

Liquidity coverage. Liquidity enhancement ensures coverage of unexpected near-term shortfalls due to temporarily underperforming CRE, unexpected costs or counterparty disruption. It provides a liquidity buffer that allows the issuer to continue meeting payment obligations to investors and counterparties. We expect highly rated instruments with non-deferrable interest to have enough liquidity to cover senior costs and debt servicing, as shown in Figure 10. We do not penalise CRE loans with lower coverage if effective structural liquidity-risk mitigants are embedded. Such mitigants could be supported by a highly diverse and covenanted tenancy or asset base, a strong legal framework, frequent payment, low complexity with few counterparties, external and implicit support, high tenant and CRE diversity, and high financial ratios. We expect liquidity enhancement to be higher for CMBSs than for CRE loans due to their greater complexity and higher number of counterparties.

Figure 10. Expected liquidity coverage for non-deferrable interest instruments²⁴

Minimum debt servicing coverage (years) ²⁵	CRE loan	CMBS
AAA	1.5	2.0
AA	1.0	1.5
A	0.0	0.5

CMBS

Controlling class. The most junior CMBS class holders are usually the controlling class, with preventive rights towards the special servicer as well as work-out strategies. CMBS class holders may differ on which work-out strategy they deem most suitable depending on their seniority in the capital structure. We analyse whether controlling class mechanisms maximise overall recovery. We assess whether the most senior class holders are protected via controlling class control valuation events that prevent the most junior class holders from retaining control when the senior class holder value is endangered. We also determine whether special servicer agreements require special servicers to maximise the present value of total recoveries.

Available fund cap. A CMBS may limit interest payable to the most junior class holders when interest proceeds are temporarily insufficient to meet total capital structure interest obligations. Such caps are usually structured via an available fund cap or a deferrable interest mechanism. We quantitatively account for this more senior class protection by adjusting our work-out period interest-rate stresses when necessary.

Equity leakage and interest-only strip. Sponsors or originators may seek to optimise their investment by trapping excess spread available to class holders based on timing and financial performance thresholds. We quantitatively assess these structural elements.

²³ Calculated as the CRE loan principal balance over the cost of a development project.

²⁴ See [General Structured Finance Rating Methodology](#) for liquidity coverage requirements for deferrable interest instruments.

²⁵ Including a minimum of EUR 200,000 equivalent of senior costs and considering interest rate hedges.

4.3 Legal analysis²⁶

We quantitatively consider legal elements for CRE loans, complemented by a securitisation legal analysis for CMBS, when possible. We assess them qualitatively when the quantitative analysis cannot capture those features.

Features we consider include:

Bankruptcy remoteness. CRE loans seek to de-link the underlying CRE risks from idiosyncratic originator and seller risks. For cash deals, the underlying assets are usually held by a special purpose vehicle (SPV) that is independent and separate from the originator/seller. We expect such segregation to be clear and effective and to cause no complications. Segregation is usually achieved via: i) a declaration of trust in which the assets are legally and economically transferred to an orphan vehicle, with the originator remaining the lender of record; ii) an outright sale where all legal, economic and servicing rights are transferred; or iii) a synthetic economic transfer right via a derivative instrument or guarantee.

Security package. CRE loans are secured through arrangements including a security over property mortgages, land charges, assignment of intra-group debt, insurance, accounts, leases, hedging, the subordinated creditor's securities, pledges over accounts and borrower shares. We expect senior rated instruments to have first-ranking security rights.

Enforceable assets. Upon default, debt holders are usually entitled to enforce the underlying CRE. However, laws may challenge the existence and enforceability of claims and obligations from the assets, prohibiting certain transactions, granting certain counterparties extraordinary termination rights or stipulating formal prerequisites (e.g. encumbrances). We expect legal opinions to cover such enforceability scenarios.

Commingling risks. For cash transactions, the issuer is exposed to commingling risks arising from relations among: i) the account bank; ii) the cash flow-collecting entity; and iii) the issuer itself. A third party is usually appointed as the account bank, which is tasked with collecting cash flows and ringfencing part of them into a segregated account. The servicer collects most of these cash flows while the original lender usually maintains the customer relationship. The market has developed several mitigants to minimise the extent and duration of the issuer's cash flow exposure. Examples are: i) the transfer of the account bank role to an identified back-up servicer when the agent triggers a certain rating level; ii) timeline and deadlines for cash transfer; iii) netting agreements; and iv) daily cash sweeps. Our cash flow analysis includes any commingling exposure we deem to be not fully mitigated.

Set-off risk. Set-off may be invoked by a debtor that holds a monetary cross-claim against the seller or originator. In this case, the debtor may be absolved from honouring the creditor's claim up to the amount of the cross-claim. CRE set-off risk typically arises if the originator is holding the obligor's deposits. Obligors may exercise set-off rights if they lose access to their deposits (e.g. upon the originator's insolvency), which could substantially reduce or nullify the enforceable claim payable to the issuer. To determine the extent of set-off risk, we consider: i) the probability of the originator's insolvency; ii) existing structural protections such as a dedicated reserve or undertaking by the originator not to open accounts with the securitised debtors; iii) the existence of country deposit scheme guarantees; and iv) whether the notice of assignment of the portfolio transfer to the issuer 'crystallises' the amount an obligor may set off against the issuer's claims (equal to the amount credited to the debtor's bank account at the time of the notice).

Events of default. CRE loans are subject to events that trigger a transaction default. These usually relate to i) non-payment; ii) insolvency and liquidation; iii) unlawfulness and invalidity; iv) repudiation; v) breach of hard default covenants; vi) misrepresentation; vii) cross-default; viii) the cessation of business or a merger; ix) financial indebtedness; x) major damage; and xi) a breach of certain obligations. We review such legal clauses, and our analysis incorporates any non-market-standard events of default while considering non-payment as the only event of default.

Non-petition. All creditors of an SPV issuer (including the investor) typically agree not to file, initiate or take part in any insolvency, liquidation, bankruptcy, re-organisation or winding-up proceedings against the SPV issuer. As such clauses may be invalid in some jurisdictions, the non-petition clause may be limited to a certain period.

Recourse. CRE loans and CMBSs usually contain a clause of limited recourse, which limits investor claims to the secured assets but not to the issuer's other assets. As CRE owners, SPVs have to be independent from the originator/seller for their assets to be ringfenced. Neither directors, shareholders nor agents of the issuer are further liable to repay investors. In exceptional cases, CRE loan debtholders have full recourse to third parties – either the sponsor, guarantor or other counterparties. In such cases, we expect losses to be lower. As such, the rating of CRE loans backed by such a fully valid and enforceable recourse from an investment-grade rated entity shall have a floor at the guarantor's rating.

Representations and warranties. True-sale transactions involve various representations and warranties related to the secured CRE loans and associated CRE. We expect them to cover i) CRE-related statuses, titles, rights of use and permits; ii) mortgages, leases, and insurance coverage; iii) CRE loans and liens; and iv) the nature of the sale transaction.

²⁶ See [General Structured Finance Rating Methodology](#) for further details.

4.4 Construction and refurbishment risks – scoring framework

Our construction and refurbishment score determines the rateability of a transaction and is a multiplicative modifier for our assumptions.

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 11 below.

Our AAA assumptions are defined as below:

- The AAA time to practical completion overrun is the assigned score multiplied by 40% of the remaining budgeted time to practical completion net of contingency time.
- The AAA cost overrun is the assigned score multiplied by 25% of the remaining non-secured budgeted capital expenditure costs net of cost contingency costs.
- The AAA non-completed asset liquidation cost is the assigned score multiplied by 20%.

Lower rating category assumptions linearly decrease from AAA to C assumption levels set to 0. The time to completion overrun to the remaining budgeted time to practical completion net of contingency time has a floor of six months and 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 estimated time to practical completion overrun 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 amount will be considered equity-funded and added to the budgeted capital expenditure plan net of fixed rewarded contracts. Such an additional undisbursed equity amount will reduce the projected stabilised value and reduce the as-is collateral value. Non-completed asset liquidation costs are incremental to liquidation costs²⁷ and reflect additional value haircuts to uncompleted CRE.

Our base case gives credit to pre-let agreements unless the estimated time to practical completion overrun would trigger a tenant termination right before it enters the premises. We also usually 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 or would lead to a capital expenditure draw-stop.

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

²⁷ See 4.10 Foreclosure analysis for further details.

Figure 11. Scoring framework with guidelines and an exemplary project

Risk assessment ²⁸	High	Medium-high	Medium	Medium-low	Low	Exemplary 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 (variable-cost contract, non-rated contractors and project manager with no track record)	Medium-weak (partially fixed cost contract, non-rated to b category-rated contractors and project manager with limited track record)	Medium (partially fixed-cost contract, bb category-rated contractors and project manager with limited track record)	Medium-strong (partially fixed-cost contract, non-investment grade-rated/neutral contractors and project manager with track record)	Strong (fixed-cost 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

Figure 12 to Figure 14 show rating-conditional and score-conditional assumptions for an exemplary 24-month project net of contingency time. For such projects, we consider six months to 19 months of time overrun (Figure 12), up to 50% of cost overruns (Figure 13) and up to 40% of additional liquidation costs upon default (Figure 14).

Figure 12. 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	6	6	6	6	6	8	10
2	6	6	6	9	12	15	19

Figure 13. 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 14. 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

²⁸ When relevant, a criteria score is equal to the simple average of its respective sub-criteria.

4.5 Illustrative rental value haircut

Figure 15 shows our RVHs for properties valued in H1 2023, derived from market rental value declines observed through a full economic cycle. We may deviate from such levels depending on the property's micro location and specific quality as well as market conditions.

Figure 15. Illustrative RVHs as at H1 2023

RVH (%)	Netherlands		Germany		UK		France		Spain		Italy	
	B	AAA	B	AAA	B	AAA	B	AAA	B	AAA	B	AAA
Office	2	31	2	31	2	31	2	31	2	32	2	34
Retail	2	36	2	36	3	43	2	36	2	36	2	36
Shopping centre	3	37	3	41	3	40	3	40	3	46	2	36
Industrial	2	29	2	26	2	26	2	26	2	32	2	26

4.6 Illustrative ranges of property and vacancy costs

Figure 16 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. We expect rent rolls to contain gross rental income by unit and the associated costs at either unit, property or portfolio level.

Figure 16. Illustrative ranges of property costs

Property costs	Application level	Metric	Retail	Office	Industrial	Residential	Hospitality	Healthcare
Asset and property management fee	Property	% GRI ²⁹	2%-5%	2%-5%	2%-5%	2%-5%	8%-14%	2%-5%
Maintenance capital expense	Property	%CV ³⁰	0.1%-2.50%	0.1%-2.50%	0.1%-2.50%	0.1%-1.30%	0.1%-2.50%	0.1%-2.50%
Leasing commission ³¹	Unit	Months ³²	1-3				N/A	N/A

Figure 17 presents illustrative ranges of vacancy costs in Europe for the main asset types. Transaction-specific vacancy costs may deviate from such levels based on property specifics, due diligence reports or local market surveys.

Figure 17. Illustrative ranges of vacancy costs

Vacancy costs	Application level	Metric	Retail	Office	Industrial	Residential	Hospitality	Healthcare
Structural vacancy	Property	% GRI	5%-15%	5%-15%	5%-10%	5%-10%	5%-10%	5%-10%
Void period ³³	Unit	Months	12-24					

²⁹ As a percentage of our point-in-time gross rental income.

³⁰ Alternatively, as a local currency amount per leased area.

³¹ We deduct leasing commissions spread over a conventional five-year lease period.

³² As a percentage of our point-in-time gross rental income.

³³ Rating-dependent

4.7 Illustrative capitalisation rates

0 presents an illustration of our stressed European absolute capitalisation rates for the main asset classes for properties valued in H1 2023. Figure 19 presents an illustration of our absolute stress levels as percentage of actual capitalisation rates for properties valued around the date of this methodology. We may deviate from such levels based on the property's micro location, its specific quality and market conditions.

Our illustrative stressed capitalisation rates and illustrative absolute stress levels expressed as percentage of actual capitalisation rates will be different for properties valued at a different time to H1 2023. Our B level stress capitalisation rates move as the latest market level of capitalisation rates evolve, plus a volatility buffer. So do our B level absolute stress levels expressed as percentage of actual capitalisation rates. Our AAA level is function of through-the-cycle average minimum and maximum capitalisation rates and volatility and will change as any of these two elements will change over the observed period.

Figure 18. Illustrative stressed capitalisation rates as at H1 2023

Stressed capitalisation rates (%)	Netherlands		Germany		UK ³⁴		France		Spain		Italy	
	B	AAA	B	AAA	B	AAA	B	AAA	B	AAA	B	AAA
Office – prime	5.6	8.1	4.2	6.1	6.1	9.2	4.7	7.3	4.4	7.4	4.3	6.3
Office – secondary	7.0	10.3	5.5	8.1	8.4	12.3	6.3	9.1	6.6	9.5	5.8	8.4
Office – periphery	9.4	13.7	7.6	11.1	11.2	16.2	8.0	11.7	9.0	13.1	8.7	12.8
Retail – prime	4.9	7.1	4.3	6.3	8.0	11.7	4.3	6.7	4.4	6.7	3.9	6.5
Retail – secondary	6.5	9.4	5.2	7.6	10.3	15.0	6.1	8.9	5.7	8.3	5.2	7.6
Shopping centre – prime	6.5	9.5	5.2	7.7	8.4	12.3	5.1	7.5	6.7	9.8	6.7	9.8
Shopping centre – secondary	6.7	9.8	6.0	8.7	8.7	12.7	6.2	9.1	7.8	11.4	8.0	11.7
Shopping centre – periphery	6.9	10.1	6.1	9.0	9.0	13.1	6.4	9.4	8.1	11.7	8.2	12.1
Industrial – prime	4.6	7.5	4.1	7.3	5.5	9.7	4.6	8.4	5.1	8.9	5.4	8.4
Industrial – secondary	5.9	8.6	4.6	7.9	7.2	11.2	5.5	9.1	6.2	9.3	6.7	9.7
Industrial – periphery	7.1	10.4	5.5	8.0	8.8	12.7	6.6	9.6	7.5	11.0	8.0	11.7

Figure 19. Illustrative absolute stress levels expressed as percentage of actual capitalisation rates as at H1-2023

Absolute stress levels on actual on capitalisation rates ³⁵	Netherlands		Germany		UK ³⁶		France		Spain		Italy	
	B	AAA	B	AAA	B	AAA	B	AAA	B	AAA	B	AAA
Office – prime	3	50	3	50	3	54	3	60	3	72	3	50
Office – secondary	3	50	3	50	3	50	3	50	3	50	3	50
Office – periphery	3	50	3	50	3	50	3	50	3	50	3	50
Retail – prime	3	50	3	50	3	50	3	59	3	57	3	73
Retail – secondary	3	50	3	50	3	50	3	50	3	50	3	52
Shopping centre – prime	2	50	2	50	3	50	2	50	3	50	2	50
Shopping centre – secondary	2	50	2	50	3	50	2	50	3	50	2	50
Shopping centre – periphery	2	50	2	50	3	50	2	50	3	50	2	50
Industrial – prime	3	66	3	82	4	83	3	86	3	77	3	61
Industrial – secondary	3	50	3	78	4	61	3	71	3	54	3	50
Industrial – periphery	3	50	3	50	4	50	3	50	3	50	3	50

³⁴ London excluded.

³⁵ Absolute stress levels on actual capitalisation rates = (stressed capitalisation rates ÷ actual capitalisation rate) - 1

³⁶ UK values are based on country average. Stressed capitalisation rates applied for properties in London may substantially differ.

4.8 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 stressed loan-to-value of the CRE loan exceeds 100%. Figure 20 shows the drivers of our all-in refinancing rate. We assume that all CRE instruments refinance for a five-year term.

Figure 20. All-in refinancing rate components

All-in refinancing rate	Drivers	Approach/background
Debt funding yield	Spot rate	Scope's interest rate framework
Cost of equity	CRE loan-to-value Simplified CRE regulations CRE	Cost of equity ³⁷
Risk premium	CRE loan-to-value Simplified CRE regulations	Risk weights Minimum expected-loss rate
CRE instrument refinancing rate adjustment	CRE CRE loan Macro conditions	Our credit view on refinancing conditions
Diversification discount rate	Herfindahl scores	Diversification discount rate

Regulations

We acknowledge the regulatory cost for real estate lending by incorporating: i) a risk weight for capital allocation to real estate lending as per Figure 21; and ii) a provision for an expected-loss rate into the all-in refinancing rate as per Figure 22.

Figure 21 relies on a simplified interpretation of the Basel framework (standardised approach) for risk weights of regulatory residential and commercial real estate exposures that are materially dependent on cash flows.

Figure 22 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.

We apply a linear interpolation between loan-to-value (LTV) buckets.

Figure 21. 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 real estate loan	35%	45%	60%	75%
CRE loan	70%	90%	110%	110%

Figure 22. Expected loss

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

CRE instrument refinancing rate adjustment

Figure 23 presents potential 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% excluding the 'property quality' criteria.

³⁷ We assume a standardised 12% return on equity for CRE businesses and a 12% capital adequacy ratio.

Figure 23. CRE instrument refinancing rate adjustment factors

CRE instrument refinancing rate adjustment framework	Criteria	Examples
Property quality	Stranded assets (non-green, outdated assets lacking investment capital expenditure), stabilised assets	Refinancing of a completed greenfield/brownfield project
Tenant credit quality	Change in tenant credit quality with move-in/out of highly rated large tenants with long remaining lease term to maturity	New 15-year lease with a publicly rated, investment grade top tenant
Macroeconomic environment	Change in the macroeconomic environment or structural sector changes affecting the perception and pricing of CRE credit risks	E-commerce, work-from-home
Esoteric CRE instruments	CRE instruments presenting non-traditional asset or liability features	Fully amortising CRE instruments, credit tenant lease CRE instruments
ESG criteria		ESG-driven margin step-up/down

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. Figure 24 and Figure 25 show the calculation.

We calculate each diversification factor score following the inverse Herfindahl formula, with each factor capped at 0.5%:

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

Figure 24. Diversification discount rate factors

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

Figure 25. Generic all-in refinancing rate calculation for a five-year CRE loan

	Rating-conditional	Indicator	Calculation
Rating scenario (1)			BBB
Currency (2)			EUR
Real estate type (3)			Commercial
Leverage (4)	Yes*	Loan-to-value 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	12.0%
Expected loss (10) = function (4)	Yes*	Regulations	0.80%
Funding yield (11) = function (1,2,6)	Yes	Scope's interest rate framework	6.01%
Cost of equity (12) = $9 \times 7 \times 8$	Yes*		1.30%
Expected loss premium (13) = $10 \div 5$	Yes*		0.16%
Diversification discount (14)	No	Scope's diversification discount rate	-0.10%
CRE instrument refinancing rate adjustment (15)	No	Scope's expertise	0.00%
Minimum all-in refinancing rate (16) = $11 + 12 + 13 + 14 + 15$	Yes		7.36%

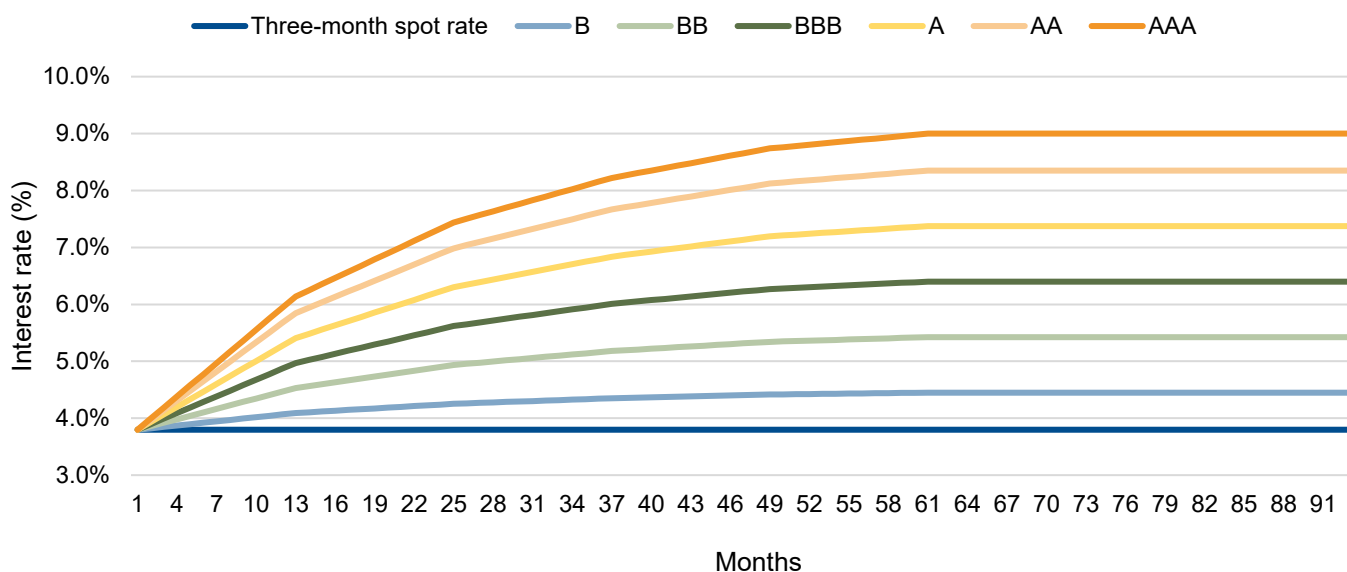
* indirectly rating-conditional because of the dependency to rating-conditional assumptions

4.9 Interest rate framework

We test a CRE loan's exposure to interest rate risk during its tenor, at the point of its refinancing and during the foreclosure period. We apply deterministic and rating-conditional interest rate vectors under scenarios of rising interest rates and, if credit-relevant, decreasing interest rates.

Figure 26 illustrates a rising interest rate scenario. We consider a gradual move in interest rate from the current three-month interbank spot rate to a perpetual rating-conditional plateau at the end of year five. The AAA plateau is fixed for EUR, USD and GBP, at 9.0% and -1.0% respectively for rising and decreasing interest rate scenarios, with a gradual convergence to the three-month interbank spot rate for lower rating categories. We assume the path to plateau to be frontloaded for all rating scenarios. We review our interest rate framework periodically.

Figure 26. Rising interest rate scenarios based on a 4% three-month spot rate (for EUR, USD and GBP)



4.10 Foreclosure analysis

We assume a foreclosure period of 24 months. This can be supplemented by sensitivity analyses considering a longer foreclosure period in non-creditor-friendly jurisdictions, non-creditor-friendly transaction structures³⁸ and stressed scenarios.

Our foreclosure cost assumptions are a function of the asset's locations and the transaction's characteristics. They serve to reduce our estimated recoveries at both collateral value and CRE loan level. Where applicable, recovery expectations are also reduced by CMBS special servicer costs³⁹.

For instance, foreclosure periods and foreclosure costs will vary if lenders benefit from mortgage rights on the assets or indirect securities like a share pledge on the property company or holding company.

Figure 27. Illustrative foreclosure costs benchmark

Liquidation costs	Level of application	Criteria	Costs
Legal costs*	CRE value	Jurisdiction & deal complexity	1%-2.5%
Notary costs	CRE value	Jurisdiction & deal complexity	0.25%-3%
Broker costs	CRE value	Jurisdiction & deal complexity	0.25%-6%
Real estate transfer taxes	CRE value	Jurisdiction & deal complexity	1%-12%
CMBS special servicer	CRE value/income	Jurisdiction & deal complexity	0.25%-1.50%

*Capped at EUR 2m local currency equivalent

As shown in Figure 28, we estimate a maximum recovery rate as a function of the CRE loan-to-value at liquidation and the rating category. We may deviate from this framework if, for example, the transaction features a recovery guarantee (e.g. a floor on collateral value, or a forward sale with a locked price).

We calculate the CRE loan-to-value based on the total outstanding liability amount for whole loans and A/B loans and based on the specific class for senior/mezzanine loans. We then apply the loss amount, determined by the maximum recovery on the total liability notional, in line with the post-default event priority of payment.

Figure 28. CRE loan maximum recovery

Exit CRE loan-to-value / rating level	C	B	BB	BBB	A	AA	AAA
10%	100.0%	100.0%	99.95%	99.91%	99.87%	99.83%	99.78%
20%	100.0%	100.0%	99.91%	99.82%	99.74%	99.65%	99.56%
30%	100.0%	100.0%	99.86%	99.73%	99.60%	99.48%	99.35%
40%	100.0%	100.0%	99.82%	99.65%	99.47%	99.30%	99.13%
50%	100.0%	100.0%	99.77%	99.56%	99.34%	99.13%	98.91%
60%	100.0%	100.0%	99.73%	99.47%	99.21%	98.95%	98.69%
70%	100.0%	100.0%	99.68%	99.38%	99.08%	98.78%	98.48%
80%	100.0%	100.0%	99.64%	99.29%	98.95%	98.60%	98.26%
90%	100.0%	100.0%	99.59%	99.20%	98.81%	98.43%	98.04%
100%	100.0%	100.0%	99.55%	99.11%	98.68%	98.25%	97.82%
110%	90.9%	90.9%	90.41%	89.93%	89.46%	88.99%	88.51%
120%	83.3%	83.3%	82.79%	82.27%	81.75%	81.24%	80.72%

³⁸ We may consider a longer foreclosure period if the transaction benefits only from mortgage rights on the assets in a debtor-friendly jurisdiction compared to a transaction benefiting from the same asset-related mortgage rights and from a share pledge on the holding company in a lender-friendly jurisdiction.

³⁹ Special servicer costs are generally around 0.25% to 1% yearly of the loan principal balance and 0.5% to 1.5% of the loan proceeds.

4.11 Notes backed by CRE debt funds

CRE funds provide investors with an indirect exposure to CRE via fund shares or notes issued by funds secured by CRE loans. 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 elements mentioned in [Section 4.3 Legal analysis](#) in relation to the issuing compartment and assess any additional risks and mitigants introduced by the multi-compartment structure and the staggered capital calls to the different limited partners.

Ramp-up portfolio. At inception, most CRE funds are either not ramped-up or only partially ramped-up. Investors are exposed to the credit quality of the existing CRE loans and future loan acquisitions. We construct a model portfolio that best represents the collateral pool's risk profile throughout the life of the transaction, building on the results of our asset manager analysis and asset analysis. Details of the portfolio at the closing date, the asset manager's ramp-up plan, and structural features such as loan eligibility criteria, maximum portfolio concentrations, trading limits and collateral quality tests also shape the model portfolio. We also assess the impact of breaches of eligibility criteria and portfolio performance-related covenants, including on future investments. We also update our portfolio as new assets are acquired.

Originator's investment style. 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) record.⁴⁰

⁴⁰ Refer to 'CLO Rating Methodology – Appendix 1 Details of the asset manager analysis' for an analysis on corporate debt and the loan manager.

4.12 Leasehold considerations

The ownership of an asset under leasehold is split two ways: i) the right of ownership over the land (freehold interest); and ii) the right of possession and use of the land (leasehold interest). Under a leasehold agreement, the parties enter into a term lease, generally over a long tenor (30 to 999 years). The lessor (freeholder) can authorise the lessee (leaseholder) to develop, maintain, improve and manage an asset on the land during the lease tenor, in exchange for ground rent. By giving away the right of possession and use of the land, the lessor can secure a bond-like, long-dated inflation-hedging instrument that ranks super senior to all other rental and mortgage payments. In the meantime, the lessee can either free up equity, assuming the land it previously owned has been leased back or build and manage properties at a discounted investment cost.

Leasehold interest

CRE loans secured by leasehold interests mainly have cash flow risk, collateral value risk and legal risk. Available net cash flows from collateral may be impaired because of increasing ground rent costs, legal costs to renew leasehold agreements or general delays in leasehold extension negotiations. Collateral value may be impaired due to lower estimated operating income and higher applicable capitalisation rates. Lastly, where appropriate, we consider legal risks and existing mitigants.

Cash flow risks impact our default probability calculation. Collateral value risks and legal risks impact our recovery assumptions. Our analysis generally reflects these risks through adjustments to the applicable capitalisation rates. We also reduce the estimated net operating income for unhedged cash flow risks, for example, an increase in ground rent costs. The risk premiums on our capitalisation rates depend on the leasehold's remaining term to maturity. For properties whose leasehold will soon expire, we give between a zero value and a value equal to the capitalised net cash flow until leasehold maturity. For leaseholds subject to automatic renewals, we deduct the predicted renewal leasehold cost from the property value.

Freehold interest

CRE loans secured by freehold interests are exposed to the same types of risk as leaseholds, namely cash flow risks, collateral value risks and legal risks. These risks are lower in absolute terms because of the senior-lien position of freehold CRE loans and the implied lower leverage. At the same time, their long-term horizon means the sustainability of the underlying leasehold interest cash flows is especially important.

We generally analyse freeholds under a forced administration scenario. Firstly, this approach delinks our credit analysis from the current leaseholder's profile and leverage, which is important as information on this can be limited. Secondly, it implies additional senior administration costs are incurred by the special administrator. In contrast to leasehold risks, we reflect freehold risks by applying stresses to cash flows, as described in our methodology, rather than applying an additional risk premium. We estimate gross income based on an indicative tenant portfolio we deem sustainable for the collateral type and location instead of the current tenant portfolio. The capacity of properties to generate sustainable cash flows over the life of the CRE loans also depends on clauses in the leasehold agreement. These clauses may stipulate minimum expenditure on maintenance and insurance and include covenants such as a maximum leverage on the financed property.

We simulate an event of default once stressed cash flows net of additional administration costs can no longer service contractual debt payments on time. Liquidation is triggered upon an event of default. We generally assess risks over a shorter period than the tenor of the freehold interest by front-loading the applicable stresses on cash flows. Refinancing risk does not drive our freehold analysis because the refinancing loss rate makes a limited contribution to our expected loss rate.

Freehold mortgages benefit from a super-senior position and low leverage, which limit the refinancing probability of default. If a refinancing default were to occur, the present value loss would still be minor due to the long freehold tenor. Its contribution to the total expected loss is therefore limited. We generally expect high recoveries for freehold mortgages, aligned with our CRE loan maximum recovery, because they benefit from low leverage and a first-lien mortgage on the land and the property. For high ratings we expect a remote probability of missed payments, irrespective of the terms and conditions, in line with our General Structured Finance Rating Methodology.

4.13 Credit tenant lease

Credit tenant leases (CTLs) are CRE loans secured by CRE let to single tenants under triple-net leases. CTLs usually result from sale-and-long-leaseback transactions and embed a tenant call option to purchase or repurchase the CRE at a set price or at market value.

The credit risk of CTLs 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 may apply a floor at tenant creditworthiness for ratings on fully amortising CTLs as opposed to non-fully amortising CTLs exposed to refinancing risk.

We expect CTLs 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 underwritten, 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) Purchase call option. Tenants may be able to purchase the CRE at a set price or market value at a point in time. We expect transaction documents to foresee a purchase price higher than the outstanding debt amount.
- 7) 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. We accept insurers' ratings from regulated and supervised credit rating agencies, and we expect insurers' ratings to at least equate to the rating of the CTL tenant or of its guarantor.
- 8) Specialised insurance. Insurers have developed policies that specifically cover lease cancellation rights following a casualty or condemnation event, or balloon payment risk at maturity. We give credit to policies that provide credit enhancement.
- 9) Lease and liability maturity. We expect the lease break to go beyond the debt's maturity, otherwise our assessment of vacant CRE value drives our calculation of recovery upon default.
- 10) Amortisation schedule. We give credit to a non-discretionary scheduled amortisation profile and may disregard refinancing risk in cases of scheduled full amortisation.

4.14 Environmental, social and governance (ESG)

CRE investors are increasingly focused on ESG factors. ESG-friendly CRE have historically outperformed comparable assets for both rental value and capital value appreciation.

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 capitalisation rates, rental values, property costs, business plan costs and timing.

Our analysis gives credit for certifications or scores on the CRE. These include Scope's ESG scores, 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).

We also consider advantages or disadvantages from regulations, in addition to ESG-linked lending terms and conditions:

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 contamination; iv) water contamination; v) presence of polychlorinated biphenyl; vi) lead paint; vii) capital expenditure plan in energy efficiency and retrofitting; viii) the borrower's climate change policies; and ix) the sourcing of plant and material.

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.

We expect major findings to be accounted for in sponsors' business plans and reserved upfront.

Social

The social aspect analysis focuses on i) insurance liabilities against human-caused disasters like terrorism or wars; and ii) societal changes affecting consumer behaviour (e.g. e-commerce, working from home), demography and living preferences (e.g. employment and affordability).

We review insurance agreements and consider information on societal changes when available.

Governance

The major focus for governance is determining the existence of: i) simple and transparent priorities of payment in allocating CRE loan proceeds and losses; ii) standard and transparent financial covenant formulas and collateral valuation assumptions; iii) ESG-linked lending criteria; iv) rights, obligations, independence, and the alignment of interests and potential conflicts of interest among stakeholders; v) ramp-up provisions and investment guidelines; and vi) non-discretionary terms and conditions upon default.

We review CRE loan agreements, servicing agreements, collateral management agreements, stakeholder liabilities and third-party reports when available.

Figure 29. CRE credit-relevant ESG factors

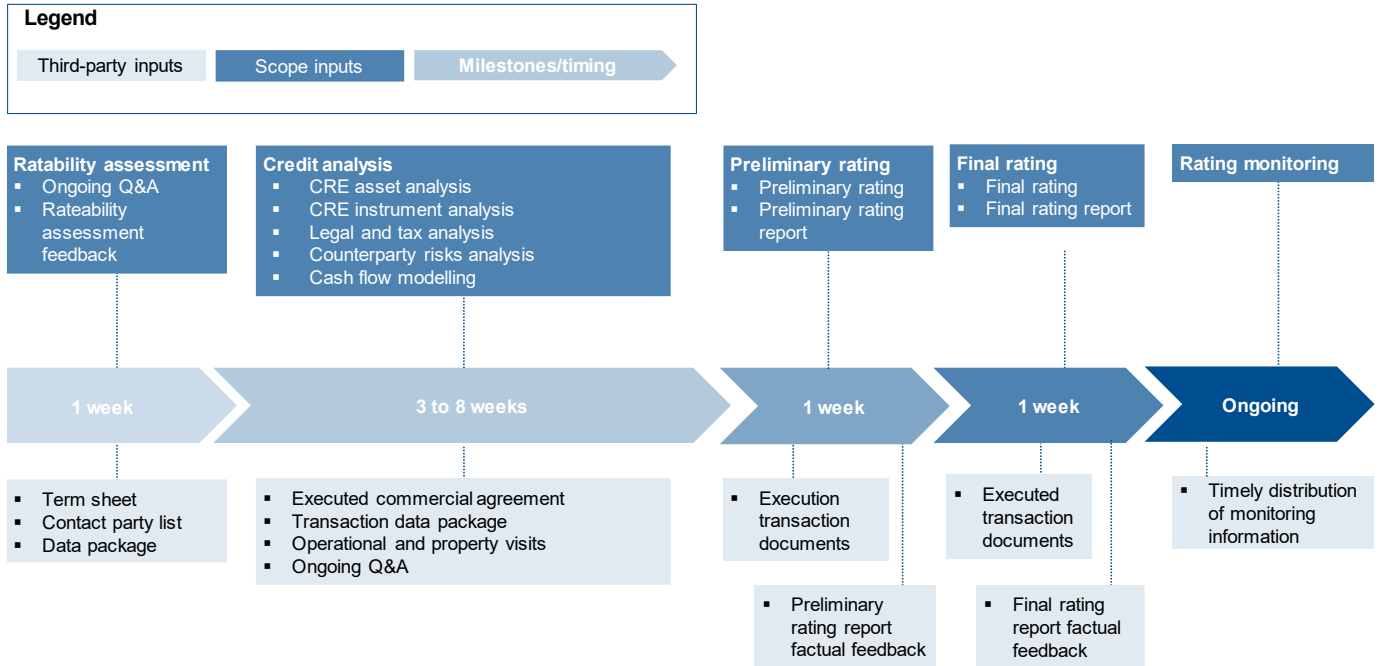
Environmental	Social	Governance
<ul style="list-style-type: none"> Environmental contamination Natural disasters Energy efficiency Environmental certifications Energy performance certificates 	<ul style="list-style-type: none"> Insurance against human-caused disasters Impact on consumer behaviour Demographic changes Living preferences Local community engagement 	<ul style="list-style-type: none"> Transaction structure Conflicts of interest Representations and warranties ESG performance-linked transaction Guarantees Reporting

4.15 CRE loan and CMBS data guidelines

Transaction data package (expected data package)	CRE loans - Credit rating services	Non-granular CMBS - Credit rating services	Granular CMBS ⁴¹ - Credit rating services
Originator information			
Underwriting standards		✓	✓
Internal credit risk model (PIT/TTC PD, rating scale, etc.)		✓	✓
Historical performance (delinquency, default, recovery, prepayment, etc.)			✓
Sponsor/asset manager information			
Sponsor/asset manager presentation			✓
Business plan and cash flow model (when available)			✓
Transaction information			
Teaser/information memorandum	✓	✓	✓
Structure chart	✓	✓	
Rent roll and arrears	✓	✓	
In-tenancy information and risk assessment	✓	✓	
Data tape		✓	✓
Transaction documentation			
Term-sheet	✓		
Issuance documents, offering memorandum, 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)	✓	✓	
Property due diligence	✓	✓	
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	✓	✓	

⁴¹ We expect granular CMBS data packages to be complemented by CRE loan data package for a sample of CRE loans (outlier CRE loans, largest exposures, etc.).

4.16 CRE loan and CMBS credit rating process



4.17 Glossary⁴²

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.

Controlling class: A CMBS class designated in a CMBS transaction that has the right to approve and direct certain actions of the special servicer with respect to specially serviced loans.

Commercial mortgage-backed security (CMBS): Securities collateralised by a pool of mortgages on commercial real estate in which all principal and interest from the mortgages flow to class holders in a defined sequence or manner.

Commercial real estate (CRE): Property that is owned and leased for the purpose of producing income.

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.

Corporate guarantee: A guarantee made by the issuer or a third party to cover losses due to delinquencies and foreclosures up to the guaranteed amount.

Credit tenant lease: A loan in which all payments are guaranteed by the credit of the tenant. The 'credit tenant' assumes nearly all obligations of ownership, therefore making the lease payments net of any offsets or deductions to the lessor or owner.

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.

⁴² See [CRE Finance Council CMBS Glossary](#) for further details.



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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 on land that includes the land but not improvements or buildings on that land. In other words, the land and buildings are separate entities and are separately owned by a leasehold owner. The building owner pays rent on the land via agreement known as a ground lease to the owner of the leased fee estate.

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 and repairs and maintenance, but exclude capital expenditures, tenant improvement costs and leasing commissions.

Operational real estate: This is a real estate investment whose performance is directly linked to the performance of the business conducted on or from the real estate (e.g. hospitality, student accommodation).

Overcollateralisation (OC): A form of credit enhancement where the outstanding principal balance of the collateral backing a security is in excess of the outstanding class principal owed to the bondholders.

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.

Triple-net lease: A lease whereby the tenant pays rent, real estate taxes, expenses and maintenance fees. This implies no running costs for the landlord.



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Scope Ratings GmbH

Headquarters Berlin

Lennéstraße 5
D-10785 Berlin

Phone +49 30 27891 0

Oslo

Karenslyst allé 53
N-0279 Oslo

Phone +47 21 09 38 35

Frankfurt am Main

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

Phone +49 69 66 77 389 0

Madrid

Paseo de la Castellana 141
E-28046 Madrid

Phone +34 91 572 67 11

Paris

10 avenue de Messine
FR-75008 Paris

Phone +33 6 6289 3512

Milan

Via Nino Bixio, 31
20129 Milano MI

Phone +39 02 30315 814

Scope Ratings UK Limited

London

52 Grosvenor Gardens
London SW1W 0AU

Phone +44 20 7824 5180

info@scoperatings.com

www.scoperatings.com

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