



CRE Loan and CMBS Rating Methodology

Structured Finance

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Contacts

Benjamin Bouchet

Senior Director

+33 1 86 26 18 76

b.bouchet@scoperatings.com

Shan Jiang

Director

+49 69 66 77 389 14

s.jiang@scoperatings.com

Antonio Casado

Managing Director

+49 30 27 891 228

a.casado@scoperatings.com

Call for comments

Scope welcomes market participants' comments on its proposed methodology.
Please send your comments by 04/12/2024 to consultation@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. We have revisited our discount rate framework (see section 2.3.3) and our rental value haircut framework (see section 2.2.3), aligned our liquidity coverage expectations with that of the General Structured Finance Rating Methodology. The update also contains editorial changes and clarifications regarding i) our property costs and vacancy assumptions (see sections 2.3.1 and 2.3.2); ii) how we capture ESG risks in our ratings (see section 3.1); and iii) data centre securitisation.

The updates are expected to impact existing CRE loan ratings but no CMBS.

1.2 Definitions and applicability

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

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

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

The methodology is predominantly applicable to instruments secured by CRE located in Europe but can also apply to jurisdictions where the CRE market and institutional framework are similar. The methodology does not apply to unsecured debt.

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

1.3 Methodology highlights

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

Yield-driven refinancing default risk. Scope exit debt yield¹ compared to an 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. Instead, we assess the likelihood of credit events associated with these risks, their severity and their marginal contribution to expected loss.

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

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

¹ Calculated as the ratio of total annualised cash flows generated by collateral and available for debt servicing relative to the outstanding principal balance of a CRE loan.

1.4 Analytical framework summary

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

The probability of default on a CRE loan is a function of a) the probability of a term default, which relates to the borrower's failure to service its contractual interest and principal obligations during the term of the CRE loan, and b) the probability of a refinancing default, which relates to the borrower's failure to refinance a CRE loan at maturity. Recovery proceeds after foreclosure are driven by the credited collateral value following a discounted valuation approach, net of foreclosure and liquidation costs. We use Monte-Carlo simulation to derive the rating-conditional cash flow and collateral value. Our stochastic approach determines the CRE loan probability of default and recovery proceeds.

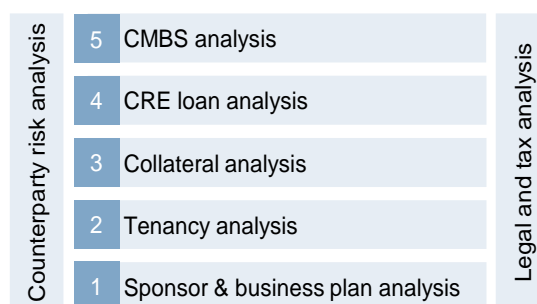
We follow a bottom-up approach which starts with i) the assessment of the quality of the sponsor and its business plan; ii) followed by the tenancy profile and rent roll; iii) the characteristics of the collateral, and iv) the CRE loan's terms and conditions.

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

Finally, we incorporate legal, tax and counterparty considerations.

Our CRE-specific expected loss approach blends a stochastic (Monte Carlo) simulation model for tenancy defaults along with a series of rating-conditional² collateral assumptions (rental value haircuts, void periods, structural vacancy rates, discount rates, interest rates) and non-rating conditional collateral assumptions (such as estimated rental values, senior costs, property costs, structural vacancy rates, terminal rental value haircut, foreclosure period and liquidation costs, etc.).

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



² The rating conditional assumptions are derived through linear interpolation between the CCC and AAA levels.

2. Detailed analytical framework

This section covers the building blocks of our qualitative and quantitative bottom-up analysis in detail. Figure 1 illustrates the main components of such analysis.

Figure 1. Quantitative building block details

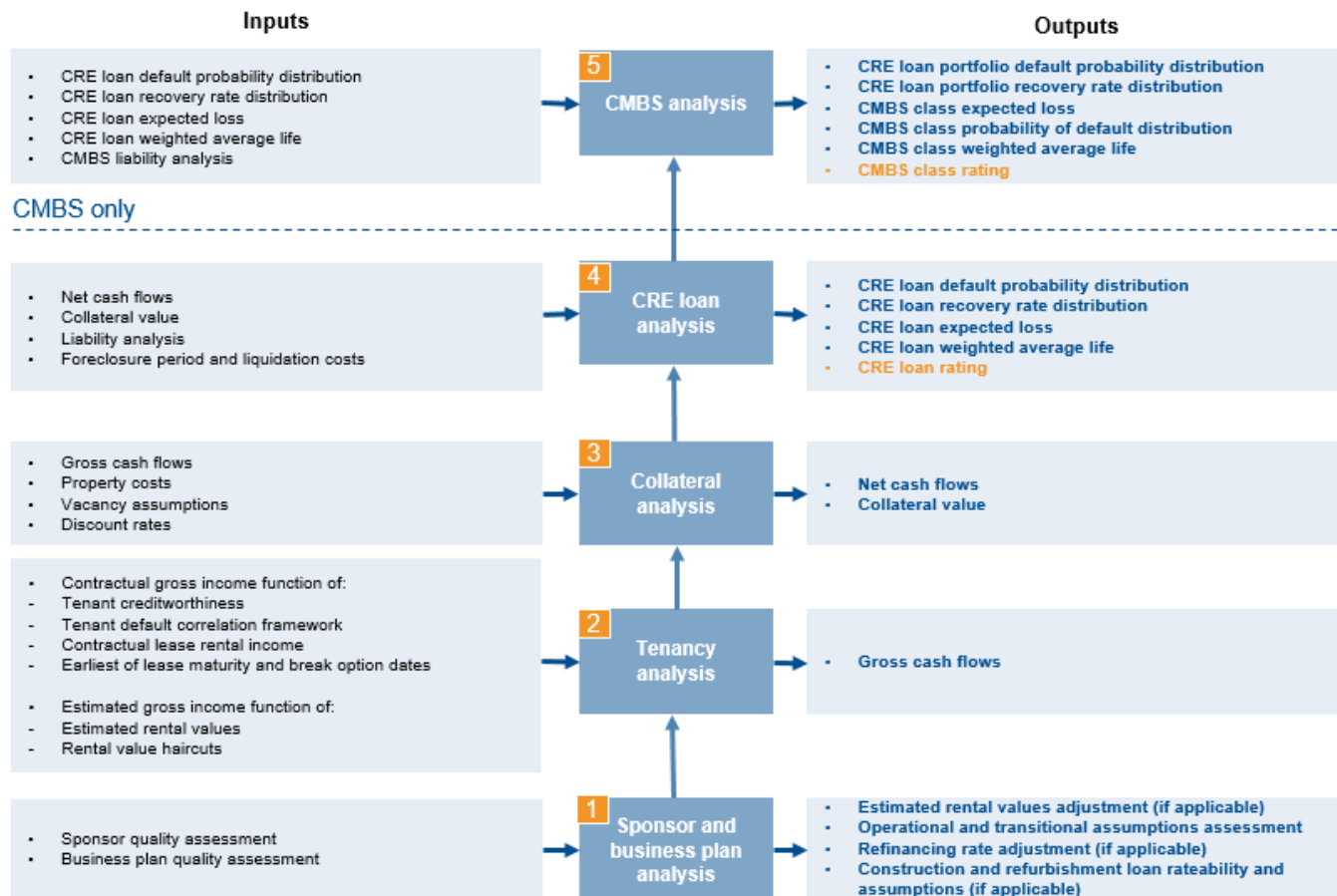
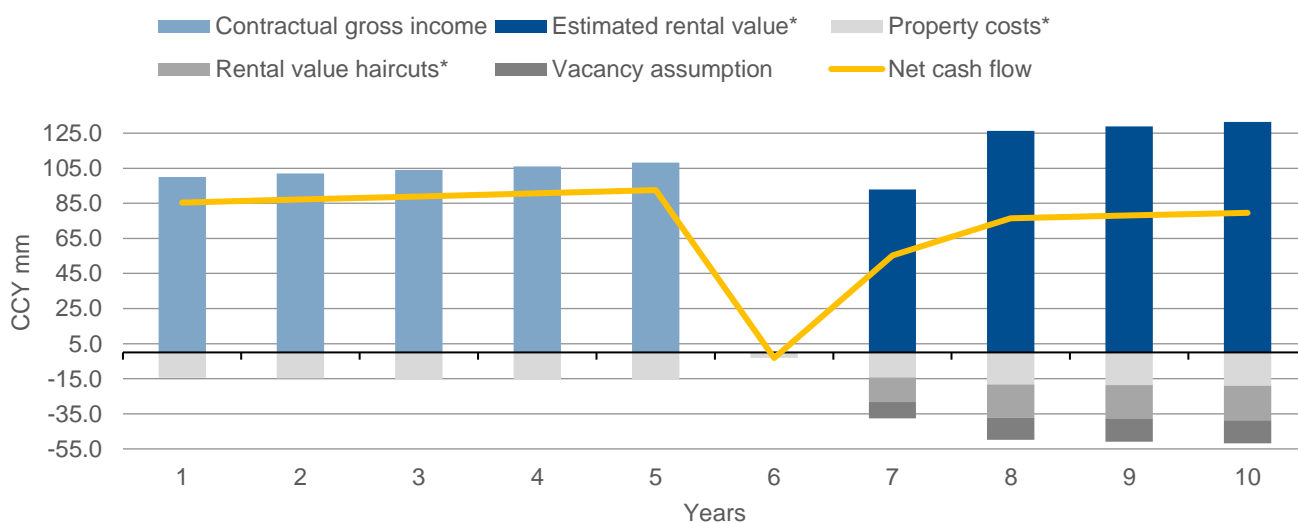


Figure 2. Illustrative net cash flow for a standard CRE property at a BBB rating stress



*rating-conditional assumptions

2.1 Sponsor and business plan analysis

2.1.1 Operational and transitional CRE

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

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

The sponsor assessment will be considered in the refinancing rate adjustments in the two years prior to the transaction refinancing: if the sponsor is weak, or if no robust refinancing plan has been presented, we will add a minimum 50bps premium.

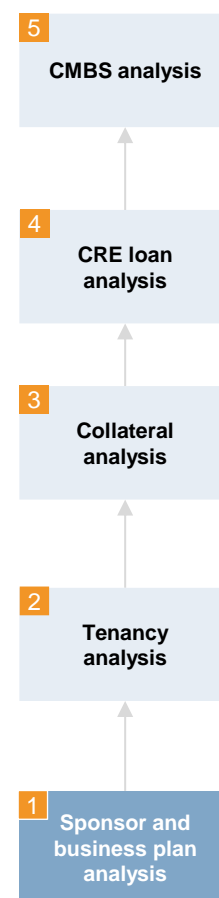
The business plan will also drive transaction specific rating-conditional assumptions such as the stabilisation periods for transitional assets, or void periods and structural vacancies if no capex is planned for the asset to meet environmental or regulatory standards.

2.1.2 Construction and refurbishment CRE

Our sponsor and business plan analysis is the same as for operational and transitional CRE but it also forms an input to our scoring framework for construction and refurbishment risks (see CRE loan all-in refinancing rate calculation)

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

The all-in refinancing rate is an integral part of our analysis and is a predominantly a function of the debt funding cost derived from the interest rate risk vector for rising rates framework detailed in Appendix VI of the General Structured Finance Rating methodology. We also consider i) regulatory costs; ii) a CRE instrument refinancing rate adjustment, and iii) a diversification discount rate. We assume that all CRE instruments refinance for a five-year term as per market standards.



Regulatory costs

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

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

Figure 3. Risk weights used to determine the capital held against each CRE loan

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

Sources: Scope Ratings, Basel Committee on Banking Supervision

Figure 4. Regulatory loss

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

Sources: Scope Ratings, Financial Conduit Authority

Diversification discount rate

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

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

Figure 5. Diversification discount rate factors

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

Source: Scope Ratings

CRE instrument refinancing rate adjustment

Figure 16 presents examples of refinancing rate adjustment factors to our all-in refinancing rate. This acknowledges qualitative elements that influence a CRE instrument's probability of refinancing. The refinancing rate adjustment will be limited between -2% and +2%.

Figure 6. CRE instrument refinancing rate adjustment factor examples

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

Source: Scope Ratings

Figure 17 give an example of our all-in refinancing rate for a five-year CRE loan.

Figure 7. All-in refinancing rate illustrative example

	Rating-conditional	Indicator	Calculation
Rating scenario (1)			BBB
Currency (2)			EUR
Real estate type (3)			Commercial
Leverage (4)	Yes*	Loan-to-value calculated by Scope at maturity	80%
Tenor of refinancing CRE loan (5)	No	Market standard five-year CRE loan	5
CRE loan remaining term to maturity (6)	No		3
Risk weight (7) = function (3, 4)	Yes*	Regulations	90.0%
Capital adequacy ratio (8)	No	Regulations	12.00%
Return on equity target (9)	No	Standard market rate	12.00%
Regulatory loss (10) = function (4)	Yes*	Regulations	0.80%



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Funding yield (11) = function (1,2,6)	Yes	Scope's interest rate risk framework	6.25%
Cost of equity (12) = 7 x 8 x 9	Yes*		1.30%
Risk premium (13) = 10 ÷ 5	Yes*		0.16%
Diversification discount (14)	No	Scope's diversification discount rate	-0.10%
CRE instrument refinancing rate adjustment (15)	No	Scope's adjustment	0.00%
All-in refinancing rate (16) = 11 + 12 + 13 + 14 + 15	Yes		7.61%

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

Source: Scope Ratings

Transaction specific analytics

Construction and refurbishment risks). The score in Figure 19 reflects our assessment of the credit risks associated with the financing purpose, time contingency, cost contingency, counterparty quality and refinancing prospects at practical completion/stabilisation. The score indicates the rateability of a transaction and the rating-conditional assumed development delays, cost overruns and additional liquidation costs. Projects scoring below 2 are typically rateable under this methodology.

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

The rent roll or tenancy of a transaction is a fundamental part of the analysis. The rent roll provides tenant information, lease details and rental income information depicting the transaction financial health and operational status. The tenancy credit risk analysis contributes in determining whether a transaction is prone to term default or refinancing default. We estimate gross cash flows consisting of i) contractual gross income up to the earlier of lease break or termination and the tenant default; and ii) estimated gross income with rating-conditional rental value haircuts applied upon relet after a rating dependent void period.

2.2.1 Tenant credit quality

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

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

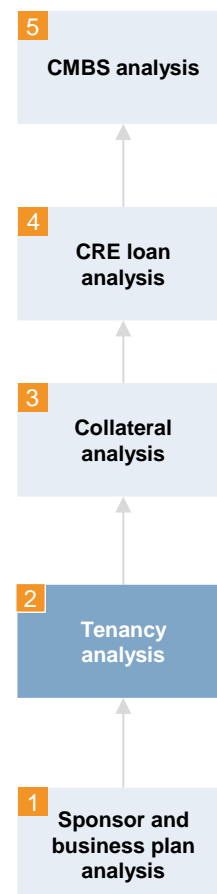
When no such rating or assessment is available, we perform a credit quality assessment based on available data on comparable benchmarks. This includes an estimated benchmark credit quality on small and medium-sized enterprises (SMEs) monitored using the European Banking Authority risk dashboard or similar sources. Probabilities of default for Western European SMEs tend to be commensurate with non-investment grade ratings.

We may conduct a dedicated tenant analysis for CRE instruments that are highly dependent on one or a few tenants (i.e. anchor tenants), particularly for single asset single tenant CRE or credit tenant lease transactions (see [Credit tenant lease](#) for further details). We do not use our stochastic framework for highly granular CRE tenancies (generally in the residential sector such as multi-family properties or student accommodations), thus we do not assess individual tenant quality. Instead, we apply a structural vacancy embedding our rating-conditional void period.

Figure 3 exhibits the market risk factors which we use for creating tenant default dependencies. The weights attributed to each factor are defined as the square root of the respective correlation parameters and ultimately determine the portfolio's tenant default-rate distribution. We may adjust the correlation framework if a transaction deviates significantly from market standards or if tenants have exceptional correlations (e.g. anchor tenant in a shopping centre) that are not addressed by the market risk factors or parameters below.

Figure 8. Indicative correlation parameters for a CRE loan³

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



³ We typically use the same 'industry mapping' as in the [SME ABS Rating Methodology](#).

2.2.2 Contractual gross income

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

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

2.2.3 Estimated gross income

Estimated gross income is a function of ERVs, inflation and rental value haircuts (RVH).

The starting point of the estimated gross income is the ERVs provided in the rental schedule. We may adjust these values if they differ significantly from third-party research or rental benchmarks⁴ and if they are not aligned with the business plan or supported by anecdotal evidence from the sponsor. ERVs are expected to increase in line with inflation (2% per annum).

We then apply rating conditional RVH to the ERV. The AAA rating scenario's RVH reflects rental level stress related to a long recession with continuously falling rents. The analysis of rental levels for the main sectors and jurisdictions leads to a 30% RVH which we anchor as our AAA-stress for all but the residential sector which has exhibited much lower rental volatility, where we therefore apply only 15% RVH (Figure 4). RVH assumptions for other rating scenarios are derived from a linear interpolation between the AAA level and no haircut at the CCC level.

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

Figure 9. Illustrative selected sectors RVH

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

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

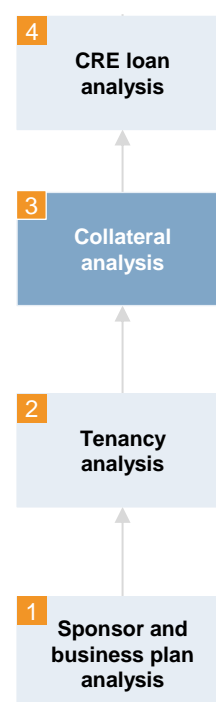
2.3 Collateral analysis

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

2.3.1 Property costs

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

We expect rent rolls to contain gross rental income by unit and the associated costs at either unit, property or portfolio level. Non-recoverable operating costs generally include real estate taxes, insurance and utility expenses. They depend on the lease and property types and are determined based on valuation reports, lease agreements or external sources. Maintenance capital expenditures are generally based on the latest collateral valuation and technical due diligence



⁴ Deal specific but generally derived from independent and recognized third party valuers

reports. We estimate higher expenditures if we deem budgeted maintenance capital expenditure to be insufficient. Management and letting costs are a function of the relevant contractual agreements.

Figure 5 represents illustrative ranges of property costs observed in Europe for the main CRE asset types. Transaction-specific and precise property costs may deviate from such levels based on property specifics, due diligence reports or local market surveys.

Figure 10. Illustrative ranges of property costs

	Application level	Metric	Property costs
Property management fee	Portfolio	% of GRI ⁵	0.5%-2.5%
Maintenance capital expense	Property	Currency per sqm/sq ft ⁶	0.5-10
Leasing commission	Unit	Months ⁷	3

Sources: Scope Ratings

2.3.2 Vacancy assumptions

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

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

Figure 11. Illustrative ranges of rating conditional void period assumptions

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

Sources: Scope Ratings

Structural vacancy represents the assumed percentage of space that is permanently vacant. For a standard CRE property, it is a rate that is function of i) location; ii) property type; and iii) structural and regulatory shifts affecting the property. For most asset types we would generally use a non-rating conditional structural vacancy rate of 10% while for granular residential or operationally intensive CRE we would typically model 5% at CCC and 30% at AAA. Transaction-specific structural vacancies may deviate from such levels based on property specifics and due diligence reports.

Figure 12. Illustrative ranges of rating conditional structural vacancy assumptions

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

Sources: Scope Ratings

2.3.3 Rating-conditional collateral value

The collateral value is calculated at each period using a discounted cash flow over a 10-year horizon, plus a terminal asset value. The terminal asset value is the present value of the terminal net cash flow divided by the capitalisation rate (the discount rate minus our annual inflation rate assumption).

The CCC discount rate is a function of i) the most relevant market yield⁸ for the property; and ii) the inflation rate assumed at 2.0%.

The AAA discount rate⁹ is a function of i) Scope's framework on interest rate risk¹⁰; ii) the transaction's remaining term; iii) the CRE historical average spread; and iv) the property sector volatility adjustment. We fix the discount rate at the rating conditional value

⁵ As a percentage of our gross rental income

⁶ As a local currency amount per lettable area.

⁷ As a percentage of our gross rental income. We deduct leasing commissions spread over a conventional five-year lease period.

⁸ We would generally use the reversionary yield but can also consider net initial yield or equivalent yield where relevant.

⁹ The AAA discount rate minimum absolute stress level is floored at 125% of the CCC discount rate.

¹⁰ The framework is highlighted in Appendix VI of the General Structured Finance Rating Methodology

given by the most conservative interest rate stress vectors from the General Structured Finance Rating methodology intersecting with the remaining term of the transaction. Based on our historical analysis of yields over their respective treasury yield, we have determined an average historical CRE spread of 3% across all sectors but residential, which is 2%. To cater for sector specific structural shifts in demand, a sector volatility premium or discount of up to 100bps can be applied depending on the property sector outlook (Figure 8 and 9). We may deviate from the sector volatility premium or discount if the properties are of better or worse quality than the average stock.

Figure 13. Property sector volatility discount or premium in basis points

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

Sources: Scope Ratings

Figure 14. Illustrative AAA-stressed discount rates for two and five-year remaining term transactions

Remaining term	2 years		5 years
	GBP ¹	EUR ¹	All
Main property sector			
Office ²	11.86%	11.35%	13.00% ³
Retail	10.36%	9.85%	11.50%
Industrial & logistics	9.86%	9.35%	11.00%
Residential	9.36%	8.85%	10.50%

¹Spot 3-month interbank rate level assumed at 5.20% for the GBP and 3.50% for the EUR in this example.

²The sector volatility adjustment is assumed at +100bps for Office, -50bps for Retail, -100bps for Industrial & logistics and -50bps for Residential

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

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

2.4 CRE loan analysis

2.4.1 Term default probability

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

2.4.2 Refinancing default probability

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

Our all-in refinancing rate at maturity is a function of: i) Scope's framework on interest rate risk; ii) the cost of equity; iii) the risk premium; iv) any transaction-specific adjustment; and v) the collateral diversification discount rate. Please refer to the appendix [Error! Reference source not found.](#) for further details.

2.4.3 Recovery rate analysis

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

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

Foreclosure cost assumptions are a function of the asset's locations and the transaction's characteristics. We would generally model according to Figure 10.

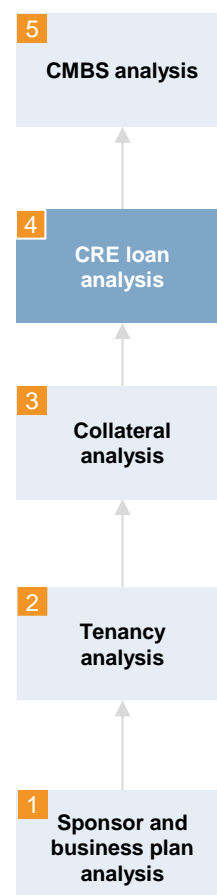


Figure 15. Illustrative foreclosure and liquidation costs

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

*Capped at EUR 2m local currency equivalent
Sources: Scope Ratings

We estimate a maximum recovery rate as a function of the rating dependent CRE loan-to-value calculated by Scope 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) or in the case of CMBS whereby loan benefits from a tail or work-out period that maximises recovery.

Figure 16. CRE loan maximum recovery

LTV / 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%

Sources: Scope Ratings

2.4.4 CRE specific characteristics

Loan covenants. We model non-default financial covenants that we deem effective and not subject to the discretion of the borrower. These covenants are usually based on cash flow performance (e.g. interest, debt service coverage or debt yield) or leverage performance (e.g. loan-to-value). These covenants generally accelerate a reduction in liabilities. We do not model default covenants because we believe that when default covenants are breached but cash flows remain sustainable, consensual solutions remain more likely than liquidation. We do consider them qualitatively in our legal analysis. We 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.

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

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

Extension option. We calculate an expected loss over the entire scheduled lending period, including extension periods. We also assume that any extension on the term of a CRE loan is subject to the renewal of the hedging agreements as per the legal analysis.

We may consider a different hedging strike rate than the initial one if it resets at the extension option date based on interest coverage multiple.

2.5 CMBS analysis

We extend the analysis to determine the probability of default and expected losses of the respective CMBS classes, in accordance with the transaction's liability structure and priority of payments.

2.5.1 Scope of analysis

The analysis of the underlying portfolio is subject to its degree of concentration. Transactions backed by less than ten CRE loans are covered by the CRE Loan and CMBS Rating Methodology, while we would generally assess the credit quality of more granular CMBS following the standard approach described in our General Structured Finance methodology.

2.5.2 CMBS specific characteristics

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

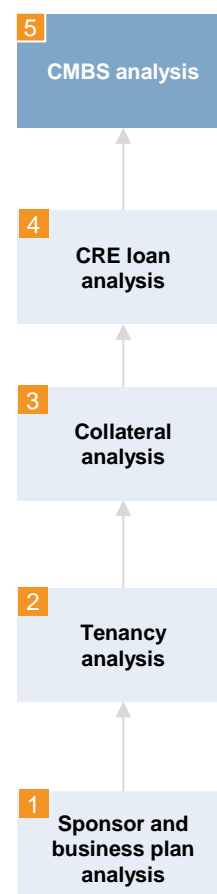
CMBS covenants. We model CMBS non-default covenants such as cash trap that we deem effective and not subject to the discretion of the borrower. These covenants are usually based on cash flow performance (e.g. interest, debt service coverage or debt yield) or leverage performance (e.g. overcollateralisation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

Ramp-up period. A CMBS may embed a ramp-up or reinvestment period. In the case of transactions where the initial portfolio is only very partially ramped, we assess whether the indicated portfolio target size, number of assets and obligors as well as weight distributions are commensurate with the transaction's strategy, the asset manager's origination capacities and the length of the ramp-up period. We analyse the risk of portfolio quality migration by considering the track record and strategy of both the originator and the collateral manager, the characteristics of the asset type, and the (re)investment guidelines and covenants in the structure. As assets can be replenished during the reinvestment period – usually subject to portfolio profile tests and collateral quality tests – the transaction portfolio's weighted average life (WAL) will be longer than that of the initial portfolio. We assume that, during the reinvestment period, scheduled principal repayments are reinvested in collateral whose risk profile is similar to that of the model portfolio

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.

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 ratio¹¹ and overcollateralisation¹² test maintenance, minimum loan-to-value¹³ levels, loan eligibility criteria and limits to the number of loan modifications.

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

Liquidity enhancement. It ensures coverage of unexpected near-term shortfalls due to temporarily underperforming loan, 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 of a minimum of six months. In line with the GSF methodology, transactions whose assets produce irregular cash flows and/or require active or complex servicing, Scope may only assign high investment grade ratings, if the minimum liquidity coverage ranges from 24 to 36 months. We do not penalise CMBS with lower coverage if effective structural liquidity-risk mitigants are embedded.

3. Complementary analysis

3.1. ESG factors

CRE investors are increasingly focused on ESG factors. We consider credit relevant ESG factors that affect the CRE's net cash flow, value and, ultimately, default probability and recovery. Such factors may affect relevant assumptions including property maintenance costs and void (section 2.1.1), estimated rental values (section 2.2.3), and the refinancing rate adjustment (Figure 17).

Environmental

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

Our analysis give credit for certifications or scores on the CRE if deemed relevant. 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 the physical climate related risks of the assets such as flood and fire and there mitigants if any. In addition, we will review and strive to analyse the energy performance of the underlying assets in order to assess their compliance with current and expected environmental regulations.

Social

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

Governance

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

CRE credit relevant ESG factors

¹¹ 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.

¹² Calculated as the secured collateral value over its outstanding debt principal balance.

¹³ Calculated as the outstanding CRE loan principal balance over its secured collateral value.

Environmental	Social	Governance
<ul style="list-style-type: none"> Environmental contaminations Physical risks or disasters Energy efficiency 	<ul style="list-style-type: none"> Secular social trend Demographic changes Social regulations impact 	<ul style="list-style-type: none"> Transaction structure Ramp-up provisions Reporting

Sources: Scope Ratings

3.2. Legal and tax analysis

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

3.3. Counterparty risk analysis

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

3.4. Data adequacy, data guidelines and portfolio data template

We can provide our CRE loan and CMBS Excel input data template also available via Scope's CRE Loan and CMBS Scorecard¹⁴. We also welcome originator/sponsor data templates and can generally process any standard format (Excel and database formats are preferred for quantitative data). For CMBS, we expect reports on agreed-upon procedures to be 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.

3.5. Rating sensitivity analysis

We test the resilience of the credit analysis against several main assumptions change. This sensitivity analysis has the sole purpose of assessing the sensitivity of our credit analysis to input assumptions and is not indicative of expected or likely scenarios. We perform further sensitivity analysis relevant for each credit analysis according to its characteristics.

Figure 17. Sensitivity tested¹⁵

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

3.6. Monitoring

The monitoring process is in line with the 'Monitoring' section of the General Structured Finance Rating Methodology.

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.

CRE and CMBS are an operationally intensive and dynamic asset classes. As such it relies on collateral managers, loan servicers to oversee and manage loan servicing and/or on special servicers to manage any distressed CRE loans. Material changes in the composition of a CRE portfolio or the structure of a CRE loan are common.

¹⁴ See [Scope's CRE Loan and CMBS Scorecard](#) for further details.

¹⁵ In addition to the sensitivities disclosed in our [General Structured Finance Rating Methodology](#).

Appendix

CRE loan all-in refinancing rate calculation

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

The all-in refinancing rate is an integral part of our analysis and is a predominantly a function of the debt funding cost derived from the interest rate risk vector for rising rates framework detailed in Appendix VI of the General Structured Finance Rating methodology. We also consider i) regulatory costs; ii) a CRE instrument refinancing rate adjustment, and iii) a diversification discount rate. We assume that all CRE instruments refinance for a five-year term as per market standards.

Regulatory costs

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

The risk weight relies on a simplified interpretation of the Basel framework¹⁶ (standardised approach) for residential and commercial real estate exposures that are materially dependent on cash flows. The regulatory loss relies on a simplified interpretation of the internal ratings-based approach for specialised lending exposures from the Prudential Sourcebook for Banks, Building Societies and Investment Firms¹⁷. We apply a linear interpolation between loan-to-value (LTV) buckets.

Figure 18. Risk weights used to determine the capital held against each CRE loan

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

Sources: Scope Ratings, Basel Committee on Banking Supervision

Figure 19. Regulatory loss

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

Sources: Scope Ratings, Financial Conduit Authority

Diversification discount rate

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

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

Figure 20. Diversification discount rate factors

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

Source: Scope Ratings

¹⁶ Available on the Bank for International Settlements website under Basel Framework, CRE – calculation of RWA for credit risk

¹⁷ Available on the FCA website under section BIPRU 4.5.13

CRE instrument refinancing rate adjustment

Figure 16 presents examples of refinancing rate adjustment factors to our all-in refinancing rate. This acknowledges qualitative elements that influence a CRE instrument's probability of refinancing. The refinancing rate adjustment will be limited between -2% and +2%.

Figure 21. CRE instrument refinancing rate adjustment factor examples

	Premium	Discount
Property quality	Stranded assets (non-green, outdated assets lacking investment capital expenditure), non-stabilised assets, etc.	Brand new property, property with strong ESG credentials, etc.
Tenant credit quality	Main lease(s) expiring shortly after the transaction's term, etc,	A new long lease with an investment grade rated tenant, very granular tenant pool ¹⁸ , etc.
Macroeconomic environment	E-commerce (retail), work-from-home trend (office), etc.	E-commerce (logistics), residential supply and demand imbalance, etc.
Structure and sponsor	Weak sponsor and/or no refinancing plan a year prior to the instrument maturity, weak or inefficient structure, etc.	ESG-criteria driven margin step-up/down, etc.

Source: Scope Ratings

Figure 17 give an example of our all-in refinancing rate for a five-year CRE loan.

Figure 22. All-in refinancing rate illustrative example

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

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

Source: Scope Ratings

¹⁸ Extremely granular tenant pool may be reduced, we would consider the actual diversification discount here

Transaction specific analytics

Construction and refurbishment risks

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

Each criterion is scored from 1 (low risk) to 5 (high risk) with a one incremental point scale between categories. A CRE instrument scoring lower than 2 is rateable under this methodology. The scoring framework is shown in Figure 18 below.

Figure 23. Scoring framework with guidelines and an exemplary project

Risk assessment ¹⁹	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

Source: Scope Ratings

Our AAA assumptions are defined as i) 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; ii) 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%.

¹⁹ When relevant, a criteria score is equal to the simple average of its respective sub-criteria.

Lower rating category assumptions linearly decrease from AAA to C assumption levels, floored at 0. The time to completion overrun to the remaining budgeted time to practical completion net of contingency time 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.

Our base case gives credit to pre-let agreements unless the estimated time to practical completion overrun would trigger a tenant termination before the lease commences. We 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 that 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

Figure 24 to Figure 26 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 24), up to 50% of cost overruns (Figure 25) and up to 40% of additional liquidation costs upon default (Figure 26).

Figure 24. Generic estimated time to practical completion overrun (in additional months to the remaining budgeted time to practical completion)

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

Figure 25. 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 26. 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

Credit tenant lease

Credit tenant lease (CTL) is a CRE loan secured by CRE let to a single tenant under a triple-net lease. CTL usually results from sale-and-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 CTL is similar to that of a senior secured bond issued by the tenant: tenant creditworthiness determines term default probability and the CRE value determines the recovery rate.

We expect CTL to embed the following factors:

- 1) Obligor economic exposure and lease agreement. Here, the tenant takes on debt servicing obligations and other economic burdens of ownership. A triple-net lease is 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) Insurance. Lease payments must not be interrupted by damage on any part of the leased collateral. We expect the tenant to directly apply collateral and casualty insurance on the CRE. Insurance proceeds should cover repair costs up to its previous fair market value as well as rental loss.
- 7) Specialised insurance. Insurers have developed policies that specifically cover lease cancellation rights following a casualty or condemnation event, or balloon payment risk at maturity.
- 8) The lease to contractually end after the debt's maturity.
- 9) A full or partial amortisation schedule.

Data centre securitisation

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

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

- 1) enterprise DCs are owned and operated by the same entity: the transaction may benefit from the entity's credit quality and significant investments in the property but lack tenant diversity and a payment default may arise at the end of the remaining unexpired lease to break if not mitigated;
- 2) colocation DCs whereby a DC operator provides the security and support infrastructure to tenants that generally require a small amount of power capacity for a short period of time (one to five years): the transaction generally benefits from a granular tenant base, a generally higher but likely more volatile rental income profile, and a rather short weighted-average unexpired lease to break (WAULB); and
- 3) hyperscale DCs typically used by a single large-scale entity such as cloud service providers and large internet companies that generally let a large amount of power capacity (in excess of 30MW) for a long period of time (in excess of 10 years): the transaction is exposed to a single or very few tenants partially mitigated by their strong investment grade credit quality, and a long WAULB. Similarly to enterprise DCs, a payment default may arise at the tenant departure or default if not mitigated.

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

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

Notes backed by CRE debt funds

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

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

Asset manager strategy. Our view on the asset manager affects quantitative parameters and influences our overall assessment of the transaction. To appraise the manager's governance quality and ability to perform under the desired strategy, we divide our analysis into five main parts i) corporate overview; ii) financial strength and business continuity; iii) operations; iv) strategy; and v) track record.²⁰

²⁰ Refer to 'CLO Rating Methodology – Appendix 1 Details of the asset manager analysis' for an analysis on corporate debt and the loan manager.



CRE Loan and CMBS Rating Methodology

Structured Finance

Transaction type specific expected data package for a credit rating

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

Sources: Scope Ratings

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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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.

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

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

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

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



CRE Loan and CMBS Rating Methodology

Structured Finance

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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