Red 2 Finance CLO 2018-1 DAC
Commercial real estate

SCOPE | Scope Ratings

Ratings

Notes (ISIN)	Rating	Notional (m)[a]	Notional (% assets)[b]	CE (% assets)	Coupon[b,c]	Final maturity
Tranche A	AAA$_{SF}$	2,283.7	82.00	18.00	confidential	26 Sep 2027
Tranche B	AA+$_{SF}$	104.5	3.75	14.25	confidential	26 Sep 2027
Tranche C	A+$_{SF}$	118.3	4.25	10.00	confidential	26 Sep 2027
Tranche D	A$_{SF}$	55.7	2.00	8.00	confidential	26 Sep 2027
Tranche E	BBB-$_{SF}$	75.2	2.70	5.30	confidential	26 Sep 2027
Tranche F	BB$_{SF}$	64.1	2.30	3.00	confidential	26 Sep 2027
Tranche G	NR	83.5	3.00	0.00	confidential	26 Sep 2027
Rated notes		**2,785.0**				

The transaction closed on 15 October 2018. The ratings are based on the final portfolio as of 11 September 2018 provided by the originator. Scope's rating definitions are available at www.scoperatings.com. The ratings assigned by Scope reflect the expected loss on each respective tranche over a risk horizon equal to the expected weighted average life of the tranche i.e. the risk for the credit protection seller to make payments with respect to credit events under the terms of the credit protection deed. [a] Total tranche notional equals 89.0% of the portfolio notional, accounting for at least 5% risk retention by Santander. [b] Credit protection premium is only accrued on the effective balance after written-off losses. [c] Credit protection premiums were disclosed to Scope and incorporated in the analysis.

Transaction details

Purpose	Balance sheet
Issuer	Red 2 Finance CLO 2018-1 DAC (Red 2)
Originator/ Collateral manager	Santander UK plc (NR)
Closing date	15 October 2018
Payment frequency	Quarterly, 20th January, April, July, October

Red 2 Finance CLO 2018-1 DAC is a synthetic securitisation of commercial real estate loans that were originated in the UK in the ordinary course of business by Santander UK plc. The legal maturity date is 26 September 2027. The GBP 2,785.0m reference portfolio is static and comprises 837 loans secured by over 2,800 underlying properties and more than 5,500 lease contracts.

Rating rationale (summary)

The ratings reflect the legal and financial structure of the transaction as defined under the terms of the credit protection deed; the credit quality of the underlying portfolio in the context of macroeconomic conditions in the UK; the ability and incentives of Santander, servicer of the reference loans; and the supervision from the verification agent, a reputable global accounting firm.

The ratings account for the respective credit enhancement of the tranches and the strictly sequential release of risk coverage from reference portfolio amortisation. The ratings also reflect the credit risk of a granular reference portfolio, characterised by material default risk at the loans maturity. Tranche B's relatively high sensitivity to changes in the loans' expected recovery rate is reflected in its rating.

The ratings incorporate the macroeconomic dynamics in the UK. Scope's market-value-decline assumptions for commercial real estate properties in the UK also reflect uncertainties associated with Brexit. Scope expects heightened uncertainties to have an adverse impact on consumer and investment confidence, which, in turn, may have a knock-on effect on commercial real estate by reducing demand and the willingness to maintain the properties' condition.

Analytical team

Sebastian Dietzsch
+49 30 27891 252
s.dietzsch@scoperatings.com

Philipp Wass
+49 30 27891 253
p.wass@scoperatings.com

Related research

General Structured Finance Rating Methodology

Methodology for Counterparty Risk in Structured Finance

Risks to Brexit Trade Talks Pronounced as UK, EU Approach Next Phase

The ratings also account for the flexibility granted to Santander to allocate losses associated with defaulted obligations that are not fully worked out at the termination of the credit protection deed. These losses will reflect Santander's accounting provisions, which introduces a certain level of discretion. The risk is mitigated as it would only be associated with obligations that default within the 5.5 years prior to the legal final termination date.

Tranches are exposed to counterparty risk with Santander regarding credit protection premium payments and recovery proceeds. This risk is mitigated by i) the high credit quality of Santander; ii) the termination of the credit protection deed upon Santander's default, which effectively cancels the exposure to the remaining reference portfolio; and iii) the netting of credit protection premiums and collected recoveries with new loss claims. Scope has a public rating on Banco Santander SA (AA- Stable Outlook/ S1+) and has also analysed the credit quality of Santander UK plc.

Rating drivers and mitigants

Positive rating drivers

Low loan-to-value on mortgages. The commercial real estate loans have a low loan-to-value of 47.6% (based on third-party valuations with an average of nine months since the last valuation), which reflects positively on recovery rates and the probability of successful refinancing at maturity.

Granularity. The five largest exposures account for only 4.7% of the portfolio. Both, the property and the tenancy base are relatively granular, which reflects positively on the stability of the loans' interest coverages.

Experienced commercial real estate lender. Santander's real estate lending activities in the UK date back to 1944 (Abbey National plc, bought by Santander Group in 2004).

Static portfolio. The portfolio is static and does not allow for loan extensions, refinancing and reference loan additions.

Negative rating drivers and mitigants

Bullet amortisation. All loans in the portfolio have bullet or semi-bullet amortisation. This decreases the likelihood of refinancing at maturity, while increasing the volatility of expected recovery upon default.

UK macroeconomic uncertainty. This may lead to lower viability of UK commercial real estate in general, especially if Brexit uncertainties result in adverse impacts on tenant's business models.

Upside rating-change drivers

Increased credit enhancement from deleveraging accompanied by **good performance** may result in upgrades.

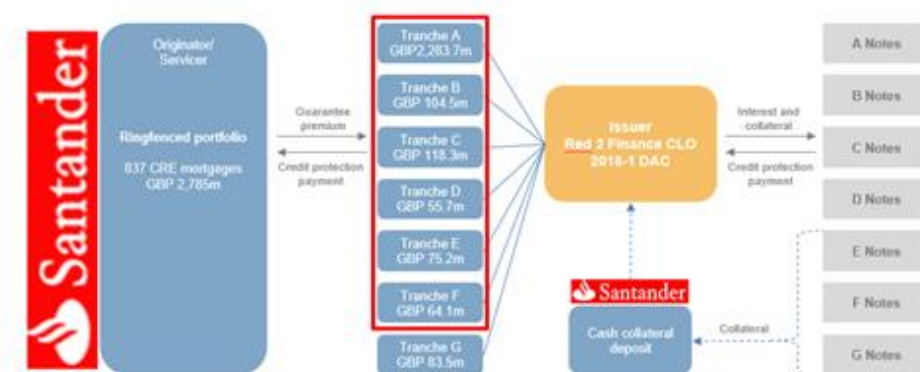### Downside rating-change drivers

Worse-than-expected default and recovery performance of the assets will result in downgrades. Recovery rates and refinancing probabilities may reduce if **Brexit** negotiation outcomes lead to lower-than-expected demand for UK commercial real estate, reflecting negatively on property values.

Red 2 Finance CLO 2018-1 DAC

Commercial real estate

1. Transaction summary

Figure 1: Simplified transaction structure

Source: Transaction documents and Scope.

Red 2 Finance CLO 2018-1 DAC (Red 2) is a synthetic securitisation of a static GBP 2,785m portfolio of 837 commercial real estate (CRE) loans originated by Santander for the acquisition of more than 2,800 properties in the United Kingdom. Red 2 sells credit protection on the reference portfolio through seven strictly sequential, fully collateralised credit protection agreements – Tranches A to G – entered into with Santander. The ratings assigned by Scope to the tranches (and not to the notes – red frame in Figure 1) reflect the risk for Red 2 to make payments after the occurrence of credit events under the credit protection deed.

2. Originator and seller

Santander supports the group-wide global operations of Banco Santander SA. The bank targets retail and corporate clients in the UK, while international clients are handled by the group. Real estate is Santander's core activity in the UK, integrating the track record of Abbey National Treasury Services which dates back to 1944.

Scope visited Santander in London to review its operations, focusing on underwriting and servicing practices.

2.1. Business positioning

This transaction is consistent with Santander's public strategy: improving the efficiency of its CRE business and adjusting the return on the capital contribution. The transaction contributes to the bank's reshaping of risk allocations in its portfolio, by freeing up risk-taking capacity from the real estate business.

The overall prudent business approach of Santander is evident in the results of its recent lending activities. Santander did not compete on the margin of loans, but rather allowed a marginal reduction of its corporate lending portfolio (which includes CRE) by 3.7% from since the beginning of 2018. This reduction came at the cost of a 5.0% decline of the banking net interest margin, but also a 13.6% reduction in the non-performing loans ratio[1].

2.2. Origination and underwriting

Santander originates the loans in this securitisation mainly via its regional real estate business unit. The channel processes the smaller and less complex financing transactions

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[1] See presentation of Santander UK Group Holdings plc 'Investor Update for the six months ended 30 June 2018', July 2018. The UK exposure reduction contains a transfer of GBP 700m to Banco Santander London Branch as part of the ring-fencing implementation, accounting for 70% of the balance reduction since the beginning of 2018.

with a balance of typically less than GBP 30m. In general, Santander's CRE activities focus on large institutional clients, or small clients with a good track record.

We consider the workflows for sanctioning and executing the CRE credit applications to be effective, limiting risk in accordance with the bank's risk appetite. Santander always involves real estate specialists at the beginning of the sanctioning process, and during final execution when necessitated by certain debt structures. The processes substantially mirror those of comparable banks, with segmentation of sanctioning authority and the separation of business and risk-sanctioning powers. Santander outsources documentation to third-party legal specialists and will occasionally call on professional advisors.

Higher approval authority is required when total facilities granted to the obligor exceed GBP 30m, or for smaller amounts deemed high risk. This involves the approval of a special lending-commitment committee and can reach up to the group's board of directors. The origination department is authorised to approve smaller, low-risk facilities of up to GBP 30m.

Credit approval occurs over four stages: i) pre-screening; ii) detailed analysis; iii) final approval when loan terms are closed; and iv) due diligence prior to drawdown.

2.3. Staffing

Adequate staffing of CRE origination and servicing

Staffing at Santander is adequate to originate and service the loans in the transaction. The CRE specialist team includes executive middle managers responsible for the origination and execution of CRE loans, with the support of associate directors. On the CRE risk side, the credit officers' experience ranges from five to 20+ years. Depending on seniority, this team is tasked with taking and preparing credit decisions in the origination of CRE loans.

2.4. Servicing and recovery

Proactive monitoring processes

Santander's monitoring processes are sound and reasonably proactive, which helps to anticipate performance issues and reduce the obligors' default risk. This process tracks: i) regular interaction with obligors; ii) management information and interim accounts; iii) covenant-compliance tests; and iv) both general and specific market information.

Santander maintains an early-warning list identifying potential problem loans. This takes place during the monitoring phase. The transaction's eligibility criteria explicitly exclude loans in the early-warning list – except for one exposure currently subject to significant refurbishment and re-letting actions.

Cooperative recovery approach

The recovery strategy is well suited to the sophisticated relationship between the originator and its obligors. This function is performed by a specialised team staffed by restructuring managers averaging at least 10 years' experience. The approach is cooperative, with the aim of helping a stressed or distressed obligor become performing again. The unit also collaborates with external advisors. Santander would only seek an exit solution or liquidation when a cure is no longer possible. Santander's work-out results during 2010-2018 showed low amounts of actual write-offs from a limited number of cases.

2.5. Alignment of interest

Santander retains at least 5% on every reference loan. The credit protection deed requires Santander to service the reference portfolio in line with their internal servicing principles. Adherence to this is supervised by the external verification agent.

3. Asset analysis

The credit protection agreements reference 837 CRE loans originated in the UK by Santander in its ordinary course of business. The loans' obligors are small and medium CRE customers of Santander.

This section describes the analysis of these reference loans. In sequence, we analysed the tenant base, the mortgaged properties, and the loans. II provides further insight on the specific analytical framework we applied to analyse the commercial real estate loans in this transaction.

3.1. Analysis of tenants

Scope has analysed the tenant base underlying each reference loan to infer the term default risk (i.e. default risk over the life of a loan).

Scope determined that the rated instruments are not materially sensitive to the credit quality of the tenants due to the diversity of the tenant base.

3.1.1. Moderate risk of disruption to rental cash flow

Contracted rents below market rents support stability of rental cash-flows

The initial loan portfolio finances properties that collectively contain more than 5,500 tenants. The tenant granularity reflects positively on the stability of rental cash flows available to pay operational expenses and debt service for most of the loans. Additionally, many tenants have incentives to maintain their leases, even beyond contractual break options, since they are paying less than market rent. More than 70% of rental cash flows are contractually secured over a period equal to the portfolio's weighted average term to maturity, which overall supports the stability of rental cash flows available for debt service. However, the stability of cash-flows varies across the portfolio loans, depending on the actual number and credit quality of tenants. Figure 2 shows the lease expiry schedule over the expected life of the transaction (red dashed line), which includes contract terminations and existing break options. The figure also shows the possibility of higher rental cash flow if a lease expires, and market rent is subsequently charged.

Negligible tenant concentration risk at the portfolio level

The portfolio has negligible tenant concentration risk at the portfolio level. Scope's statistical analysis adjusts for concentrations at tenant level and makes assumptions on tenant behaviour at lease expiration or lease break-up, considering current rent relative to a sustainable market level (described in II).

In addition, the good diversification of properties across regions and property types partially mitigates the impact of Brexit related market corrections that are primarily associated with offices in the greater London area. Especially the residential portion of the portfolio is a stabilising factor here.

Figure 2: Rental cash flows – contractual and market level; weighted average portfolio maturity (red dashed line)
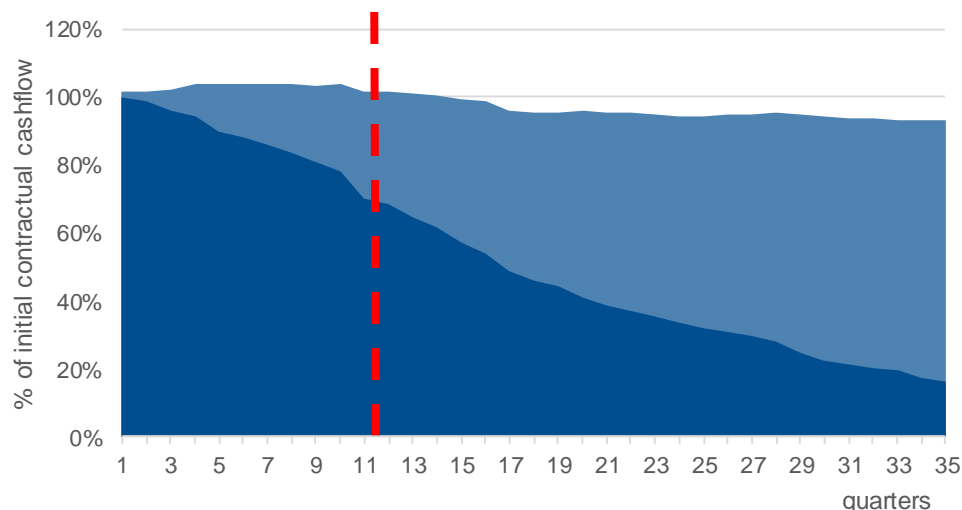
Source: Santander and Scope.

3.1.2. Creditworthiness of tenants

We assumed the weighted average default risk for tenants to be of a credit quality that commensurate with a BB- rating by Scope. Scope has estimated the tenants' credit quality by assuming they are UK enterprises of average credit quality, along with using internal ratings and credit estimates when available. This generic approach is appropriate given the granularity of the overall tenant base (over 5,500 tenants for the initial portfolio).

The default risk of UK enterprises is commensurate with that of a company rated in the BB range by Scope. Default probabilities in this analysis represent historical insolvency rates and are consequently not subject to any cure rate. We analysed the insolvency frequency during 2007-18 for UK enterprises and estimated one-year default rates. Figure 3 shows the performance since the beginning of the 2007 financial crisis, a period of significant stress. The average quality of rated tenants is about seven notches better than that of non-rated tenants. However, the rated tenants account for only 0.7% of the contracted net rental income, thus their positive impact on the overall tenant credit quality is marginal.

Figure 3: Insolvencies in the UK vs GDP growth rates from 2007 to 2018 (expected)
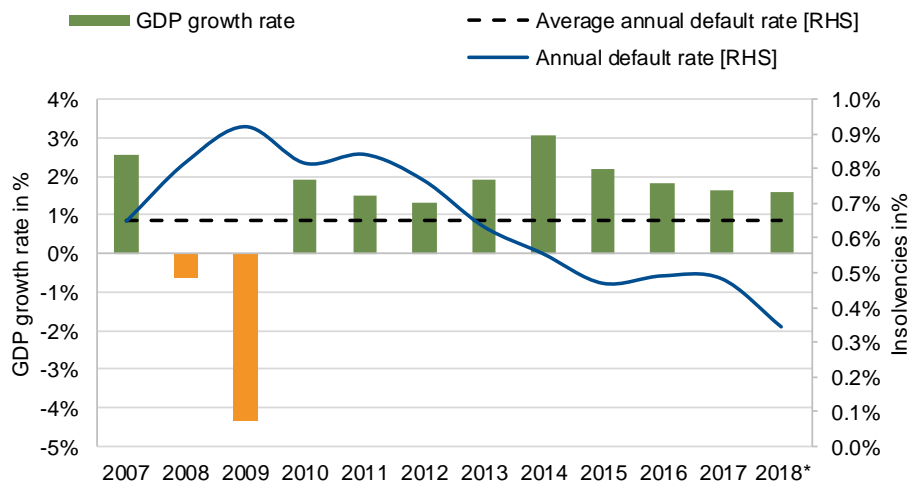
Source: Companies House UK, National Statistics UK, Scope
* 2018 expected.

3.2. Analysis of mortgaged properties

We examined the properties backing the transaction's loans to derive loan-specific refinancing default probabilities (i.e. at contractual maturity) and expected recoveries upon default. Our analysis considers property values under a long-term view in the economic cycle – indicative of its sustainable value – and incorporates market conditions we expect following the Brexit vote.

Our market-value-decline assumptions for this transaction incorporate the distance between the sustainable value and the current market value of the assets securing the loans. Scope applied a property-value haircut, i.e. a rating stress, which increases with the target rating from the B base case up to the AAA scenario.

3.2.1. Quality of mortgaged properties

We mapped property characteristics as per the valuation reports and information provided by Santander to 'property grades', which reflect the quality of a property from best (PG1) to worst (PG5). II details the factors considered in our analysis. The analysed portfolio's average property grade is PG2.6 (average) based on information from external appraisal reports. This implies some downside risk, in our view, as the market value of high-quality properties tends to be more susceptible to market cycles than that of lower-quality properties in consolidated markets.

Scope has assessed property quality as a function of its location, age, last completed refurbishment, and expiry schedule of leases. Figure 4 shows Scope's assessment of property qualities based on property values and the number of properties.

Figure 4: Distribution of property grades (PG)

Source: Santander and Scope.
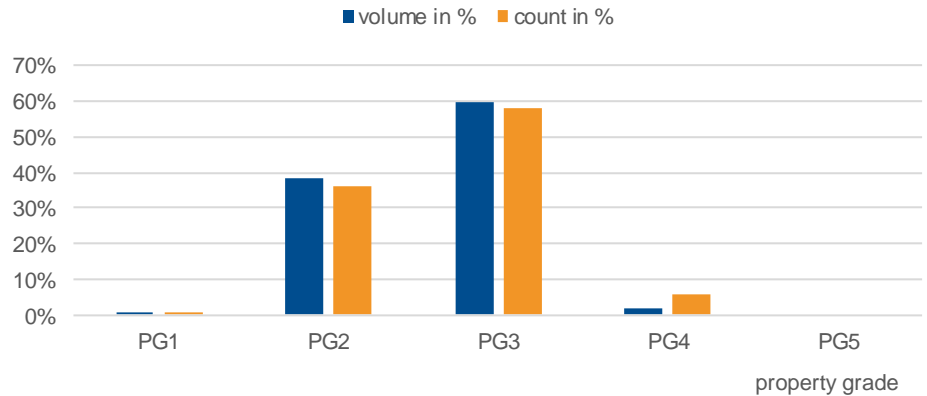
3.2.2. Property-market environment

Brexit increases uncertainty in UK CRE markets

Political risks in the UK have risen significantly since the Brexit referendum, and ongoing negotiations between the EU and the UK have so far not alleviated the situation. In the case of a 'no deal' Brexit – which we still consider to be a rather remote scenario – we expect demand for CRE space to reduce among tenants and investors alike. This could increase CRE loan defaults, in turn weakening sponsors' credit profiles. However, we anticipate no long-term impact on tenant and investor demand. First, companies seeking to maintain EU market access are likely to simply build beachheads in the EU rather than relocate their whole business; and second, investor money is likely to still flow into the UK once Brexit effects can be quantified, following the current pattern with most net investments coming from outside the UK and EU.

The UK property market continues to be dynamic and relatively sound. However, we expect the market to adjust to the new environment, subject to the value corrections expected. Before the referendum, capital values were growing, boosted by rising rents, and yield reductions were flattening out. Nevertheless, the uncertainty will remain until the actual Brexit terms are revealed.

The short- and medium-term reduction of take-up and rents will impact the portfolio's performance only marginally, as many lease contracts exhibit below-market rents. Lease expirations are distributed over the portfolio life, with a weighted average unexpired lease term of 3.9 years. Further, we expect yields to rise because property prices adjust faster than rental contracts can be restructured. This results in higher leverage for the loans, which reflects negatively on refinancing default probabilities and expected recoveries. The effect is, however, partially mitigated given the portfolio's relatively low average loan/value ratio.

Figure 5: Property types by market value and property
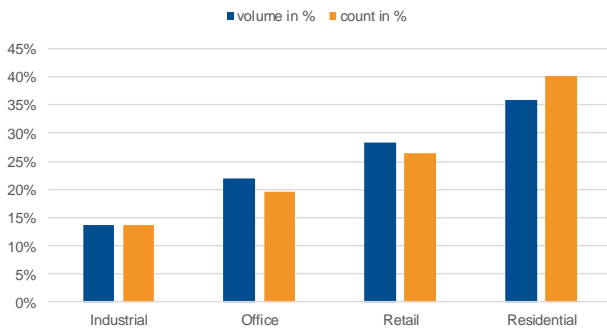
Figure 6: Property location by market value and property count
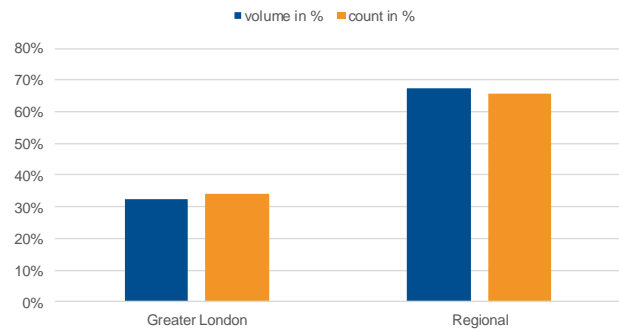
Source: Santander and Scope.

Scope has built assumptions for the average UK property market per property type, leveraging on historical figures and forecasts provided by industry experts[2]. Figure 5 and Figure 6 show the distribution of properties by property type and general location.

Scope stressed property cash flows accounting for vacancies

3.2.3. Length of vacancy periods and re-letting likelihood

Scope has stressed property cash flows by considering vacancy periods after a tenant defaults or vacates the property (e.g. when rents are above market level). Vacancy periods assumed after the termination of a lease were 10 months for offices, 20 months for retail space, 11 months for industrial space, and 4 months for residential properties – given a base average property quality (PG3). Figure 7 shows these vacancy periods as they relate to average lease durations and structural vacancy rates. We have derived these assumptions based on Scope's internal real estate database as well as public data.

We adjusted the vacancy rate assumptions of the market average (PG3) by taking up to +/- 50% deviations from the mean. For example, we assumed a five-month vacancy for the best-quality office (PG1), i.e. 10 months for property grade PG3 minus 50%.

Figure 7: Vacancy periods by property type (assuming property grade PG3)

	Residential	Office	Retail	Industrial	Other
Average lease duration (months)	120	120	150	120	90
Structural vacancy rate	3%	8%	13%	9%	6%
Vacancy period (months)	4	10	20	11	5

Source: Scope, Cushman & Wakefield, Springboard, UKWA, Savills.

Scope's re-letting assumption considers structural market vacancies

Our re-letting assumption includes structural market vacancies because, in our view, regardless of quality a property can always be re-let if rents are adjusted accordingly. For example, a new tenant's rent for a PG3-grade office reflects the full market rent minus the structural vacancy of 8%, thus 92% of market rent. Our analysis did not consider up-letting from the current lease profile in the portfolio's properties.

3.2.4. Sustainable property value

The portfolio's sustainable property value is lower than current market value. The latter still reflects the pre-Brexit environment in the UK, i.e. excludes the potential relocation of corporations. Low interest rates have brought yields close to historical lows. The sustainable property value is based on Scope's assumptions on yields and the net rental cash flows of portfolio properties.

UK CRE market specific property price index

Our yield assumption is based on the price index we constructed specifically for the UK CRE market. This index considers all property types and is based on the weighted

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[2] CBRE, Cushman & Wakefield; Savills, BNP, Scope.

average net initial yield. The reliance on one index is appropriate because the distribution of property types in the reference portfolio aligns with that of the general UK CRE market.

Scope assumes that the UK market is currently overpriced

Scope assumes that the UK market is currently overpriced, i.e. above the sustainable level. Nevertheless, this situation is not as severe as in 2008; current interest rates and real margins embedded in the yields suggest current prices are sound in terms of fundamentals. However, we factor in uncertainties from Brexit, which effectively reduce our assumption for the sustainable path, reflecting the uncertain CRE demand. Figure 8 shows this price index, representing prices as rental multipliers and incorporating Scope's view on a post-Brexit CRE environment in the UK, i.e. an only marginal increase in sustainable price levels.

Sustainable price levels consider post-Brexit scenario

Figure 8: UK property-price index and post-Brexit assumptions
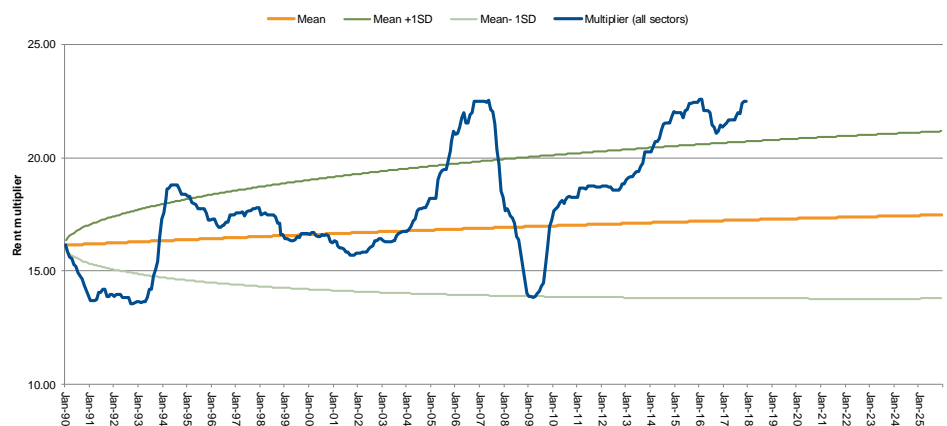
Source: Scope and Savills.

3.3. Loan analysis

Scope's loan analysis combines the analysis of tenants and properties in order to produce loan-specific default and recovery assumptions, which have, in turn, been used to create the distributions of portfolio defaults and losses.

3.3.1. Lifetime default rate

The lifetime default rate of the portfolio is mainly driven by the probability of default at maturity, which creates a back-loaded term structure of defaults for the reference portfolio. The relatively low weighted average loan-to-value ratio of the portfolio results in generally high recoveries for the portfolio.

Scope expects loan-to-value levels to rise over the life of the transaction

The mainly bullet nature of the portfolio loans in combination with a market that is above its historical levels and that we expect to revert reflects negatively on the likelihood of a failure to refinance the loans at their respective maturity. Scope expects loan-to-value levels to rise from the currently low 49.0% (Figure 9). This accounts for the bullet nature of the portfolio and Scope's market-value-decline assumptions. Refinancing default probabilities are a loan-specific function of loan-to-value ratios and property quality (see Figure 10 and Figure 29 in 'II Commercial real estate loan analysis').

The sound weighted average interest coverage ratio of 3.0x reflects positively on the lifetime default rate. However, the levels and also the stability vary across the portfolio, accounting for, the contracted weighted average unexpired lease term (WAULT) of 3.9 years, and Scope's assumptions regarding obligor credit quality, void periods and re-letting behaviour.

Figure 9: Development of loan-to-value over time
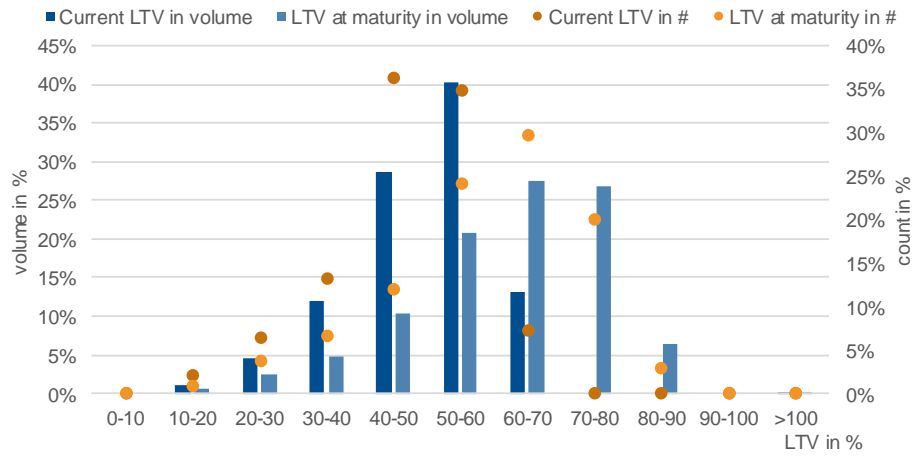
Source: Santander and Scope.

Scope assumes that lenders will accept higher leverage levels for high-quality properties (PG1). In these cases, loan-to-value ratios could reach 85%, equivalent to a 15% equity contribution. Figure 10 shows the minimum equity and consequently the maximum loan-to-value ratios we assume are necessary to refinance a property, as a function of its property quality expressed as a property-grade score.

Figure 10: Minimum equity and maximum loan-to-value to enable property refinancing in the UK

Property grade	PG1	PG2	PG3	PG4	PG5
Minimum equity contribution	15%	25%	35%	45%	55%
Maximum loan-to-value ratio	85%	75%	65%	55%	45%

Source: Scope.

Scope's refinancing default probabilities consider volatility of UK property prices

Scope's estimates of refinancing default probabilities are based on the volatility of UK property prices (i.e. a price index including all property types) and the five-year risk horizon of typical UK loans. Figure 29 in 'II Commercial real estate loan analysis' shows these refinancing default probabilities as a function of the property grade and loan-to-value at maturity.

3.3.2. Rating-conditional loan-level recovery rates

On average, the loans in the portfolio exhibit low loan-to-value ratios, which support high recovery rate assumptions, even under a AAA-conditional stress. Figure 11 shows the weighted average loan-level recovery rates under different rating stresses, also accounting for rating-conditional caps (see '3.5.2 Portfolio recovery rate': Figure 18).

We have applied a 21.3% property-value haircut to anticipate a stepwise reversion to the UK property price mean over a period of 3.5 years. Scope seeks to increase the stability of high investment grade ratings by avoiding pro-cyclicality in its assumptions. The loan-level recovery rates assume prices will revert to the level we believe is sustainable for specific properties, minus an additional rating-conditional value haircut. This haircut accounts for distressed-sale discounts, liquidation costs and potential value volatility over the risk horizon and until the loan matures.

Figure 11: Assumption for weighted-average rating-conditional loan-level recovery rates per quarter
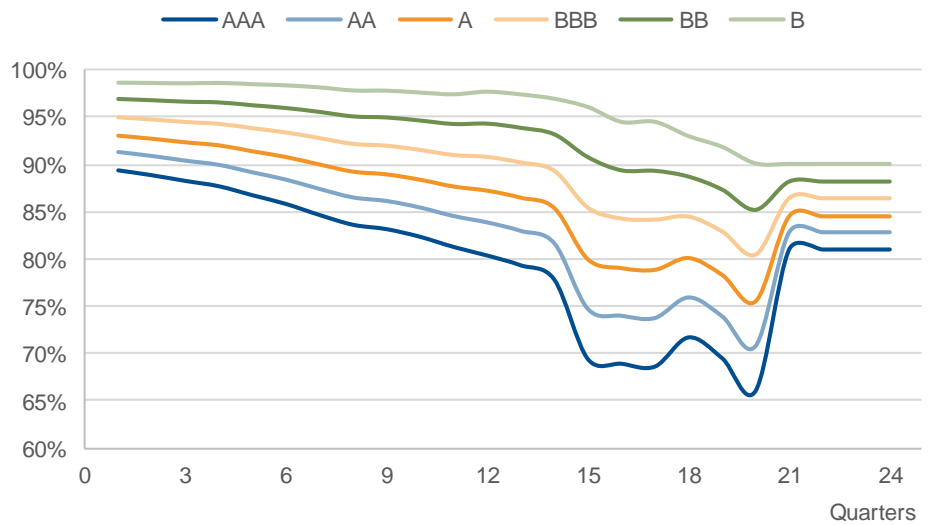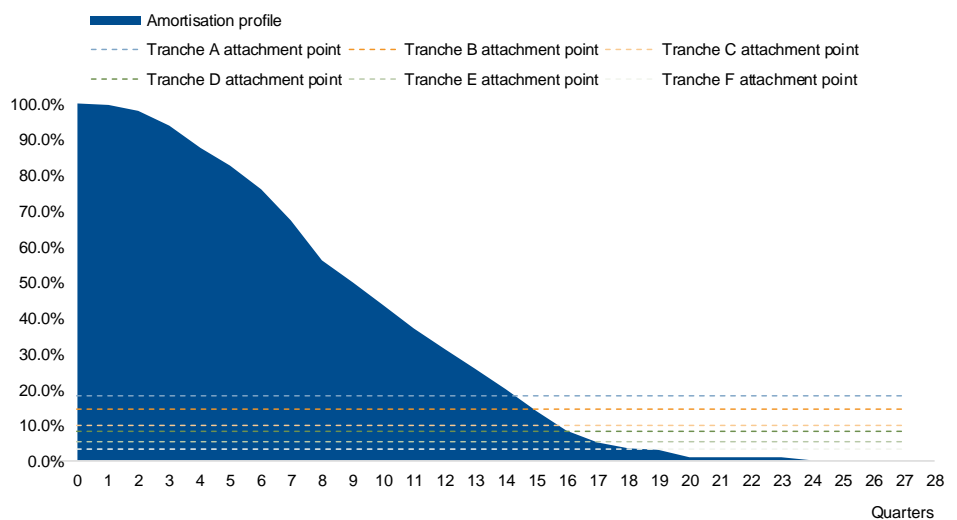

Source: Scope.

The rating-conditional haircut increases from 0% under the base case applicable to a target rating of B, linearly, to 28.7% for AAA. The distressed-sale discounts and liquidation costs are shown in Figure 31 in 'II Commercial real estate loan analysis' over the risk horizon and until the maturity of the loan.

3.3.3. Amortisation profile

Amortisation profile reflects the pool's granularity and the loans' bullet nature

The amortisation of the portfolio reflects the pool's granularity and the loans' bullet nature. The weighted average life is relatively short at 2.8 years. Figure 12: Portfolio amortisation profile shows the amortisation profile, including the tranches' credit enhancement levels, indicating tranche lives under zero prepayments.

Figure 12: Portfolio amortisation profile

Source: Santander and Scope.

3.4. Bank-internal risk assessment of reference portfolio

All loans in the portfolio are performing and show a maximum bank-internal rating of 6, which compares to the UK regulatory slotting category of 'Satisfactory' (see Figure 13: Mapping of obligor risk slots to risk weights for regulatory capital calculation and Figure 14: Mapping of obligor risk slots to expected loss for regulatory capital calculation). 20

loans accounting for 3.8% of the closing portfolio are on the bank's internal watch lists, as a result of the bank's proactive monitoring approach.

Figure 13: Mapping of obligor risk slots to risk weights for regulatory capital calculation

Risk weights	Category 1 Strong	Category 2 Good	Category 3 Satisfactory	Category 4 Weak	Category 5 Default
< 2.5 years	50%	70%	115%	250%	(bespoke)
≥ 2.5 years	70%	90%	115%	250%	(bespoke)

Source: European Banking Authority

Figure 14: Mapping of obligor risk slots to expected loss for regulatory capital calculation

Expected loss	Category 1 Strong	Category 2 Good	Category 3 Satisfactory	Category 4 Weak	Category 5 Default
< 2.5 years	0.0%	0.4%	2.8%	8%	50%
≥ 2.5 years	0.4%	0.8%	2.8%	8%	50%

Source: European Banking Authority

3.5. Portfolio analysis

Scope has taken a forward-looking, long-term view on the risk of the portfolio. We believe current market conditions are volatile (see 'Sovereign risk' on page 18).

3.5.1. Portfolio lifetime default rate

High portfolio default rate driven by refinancing default probability

Scope has derived for the outstanding portfolio an average default probability of 28.4% for a weighted average life of 2.8 years. The high rate is mainly driven by the reference exposures' probability of refinancing failure at maturity. Figure 15 and Figure 16 give an overview of the default probability distribution and the default timing.

The overall high default risk also shows in the relatively low dispersion of the default rate distribution. The low coefficient of variation[3] (45.0%) reflects Scope's high default risk assumption on the loans. The expected portfolio losses are nevertheless limited, i.e. 1.4% under the base case, rising to 7.3% under the AAA rating-conditional recovery rate. This is due to the relatively high recovery rates, which are a result of relatively low loan-to-value ratios and the properties' good quality on average.

The portfolio lifetime default rate incorporates a 1 notch equivalent default rate stress for top-exposures[4]. Scope applies the stress to capture the impact of data limitations in the context of the applied analytical approach.

Scope has used a concentrated-portfolio approach

Scope has analysed the reference portfolio loan by loan and simulated its performance using a single-step Monte Carlo simulation implementing a Gaussian-copula dependency framework. Scope has produced a non-parametric probability distribution of portfolio loss rates for this transaction.
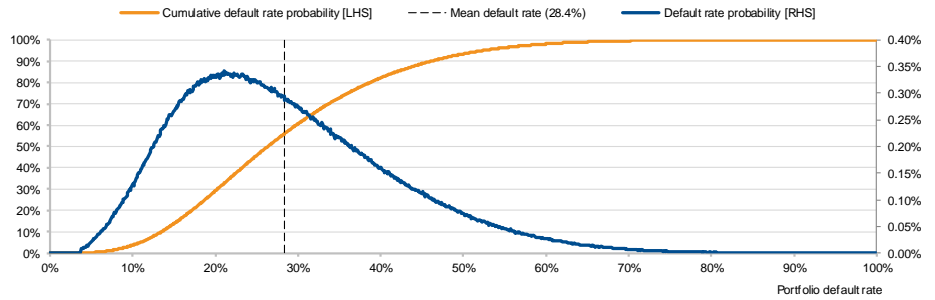
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[3] The coefficient of variation is standard deviation divided by the mean. The default distribution is non-parametric, and metric is provided for reference purposes only.
[4] Top-exposures as defined in Figure 17.

**Figure 15: Portfolio default rate probability distribution**

Source: Scope

The weighted average default timing of 2.4 years is a reflection of the portfolio loans' maturities

The portfolio simulation also produces the expected timing of defaults and losses. This reflects the underlying loans' default probabilities, both over their terms and at maturity. The default and loss-timing vector reflects the bullet amortisation profile of the portfolio, i.e. the defaults and losses are expected to happen upon the loans' respective maturity.

Figure 16: Default and loss timing resulting from simulation
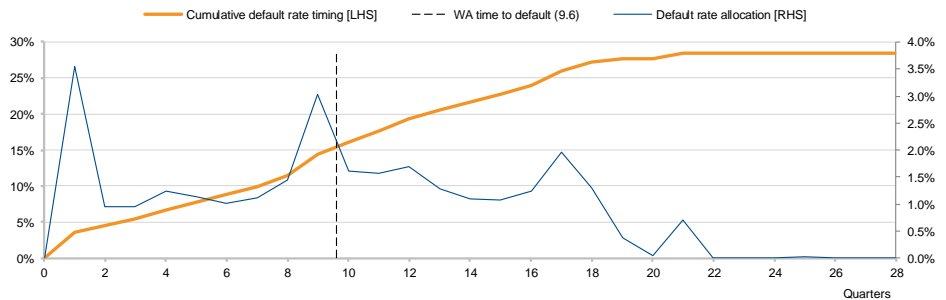
Source: Scope

Scope's Monte Carlo simulation has implemented a multi-factor correlation framework

The simulation relies on a multi-factor correlation framework adjusted for concentrated portfolios to account for the single-sector exposures. This framework is designed to capture the characteristics of the underlying properties, which drive the default probabilities of the loans in the portfolio.

We have assumed a maximum pair-wise correlation of 70% for the loans, split into four factor categories (see Figure 17). Each loan is exposed to at least one factor in each factor category. Loans that Scope considers large exposures in the context of the reference portfolio were stressed by applying an additional 20pp to the pair-wise correlation.

This correlation framework creates dependencies between the defaults to capture the loans' complex natures, a result of exposures to multiple UK regions and property types. Figure 17 summarises the correlation framework we have applied.

Figure 17: Asset correlation assumptions used for the transaction

Factor category	Factor values	Correlation
Global	N/A	15%
Location	Greater London, regional	15%
Property type	Industrial, office, residential, retail, other	20%
Largest loans (> 5%, top-5 exposures or top contributors to the portfolio expected loss)	Largest loan or contributor of at least 1% to the portfolio expected loss	20%

Source: Scope

3.5.2. Portfolio recovery rate

The portfolio recovery rates are high, even after capturing post-Brexit stresses. This is the result of the low loan-to-value of the loans in the portfolio. We have assumed a AAA-

conditional recovery rate of 74.1% and expect an 95% recovery rate on the portfolio (i.e. B-conditional recovery rate). Figure 18 lists the portfolio-level rating-conditional recovery rates.

Idiosyncratic recovery risk of the loans is captured by applying loan-level caps

We have addressed the idiosyncratic recovery risk of the loans by applying loan-level caps to the maximum recovery rate achievable under each rating-conditional recovery stress. This cap constitutes a stress that dismisses the loan-to-value buffer available at loan level, which would result in higher recovery rates. Additionally, the portfolio recovery rates incorporate a 10% stress on the recovery rates, which applies to top-exposures and to exposures that default within the 5.5 years prior to the transaction's maturity.

Figure 18: Rating-conditional recovery rate assumptions

Rating stress	Loan-level recovery cap applied	Rating-conditional recovery rate
AAA	95%	74.1%
AA	96%	78.3%
A	97%	82.4%
BBB	98%	86.6%
BB	99%	90.8%
B (base case)	**100%**	**95.0%**

Source: Scope

4. Credit protection mechanisms

4.1. Credit protection structure

Red 2 covers up to 95% of portfolio losses

At closing, Red 2 and Santander entered into a credit protection deed, including seven strictly sequential credit protection agreements – Tranches A to G –, whereby Red 2 sells credit protection on the reference portfolio and covers up to 95% of the portfolio's losses. The loss attachment points, i.e. the respective credit enhancements, are: Tranche A, 18.00%; Tranche B, 14.25%; Tranche C, 10.00%; Tranche D, 8.00%; Tranche E, 5.30%; Tranche F, 3.00%; and Tranche G, 0.0%.

Every quarter, Santander will pay a protection fee to Red 2 that covers all expenses of the protection seller. This combines i) the credit protection premiums of Tranches A to G (based on the effective tranche balances, i.e. outstanding tranche balances minus allocated losses); ii) taxes and costs of Red 2; iii) realised recoveries in excess of expected recoveries; and iv) make-up fees, which reflect unpaid credit protection premiums, or those paid in excess with respect to the difference of expected and realised losses on the reference portfolio.

The credit protection deed minimises cash flows between Santander and Red 2 through netting, which applies unless either of the two parties has defaulted.

4.2. Default and loss definitions

Santander can claim a credit event when a loan in the reference portfolio defaults. A loan default is defined in the transaction as: i) a failure to pay with respect to the reference obligation; ii) a bankruptcy of the obligor or obligor group; or iii) a loss from the restructuring of a reference obligation. The structure also allows for potential defaults, for example, on loans under a grace period for which default is already anticipated as soon as this period ends.

Definition of realised loss considers a workout period of up to 5.5 years

Under the credit protection deed, Santander receives cash payments equal to 35% of the outstanding balance of a reference obligation upon its default. This loss is then adjusted for the actual loss during a maximum work-out period of 5.5 years. After this work-put period, the final loss will be allocated to the credit protection instruments. In most of the cases, this loss accounts the final realisation of all available security under a loan, or the sale of the exposure.

The credit protection agreements grant some flexibility to Santander with respect to the allocation of losses associated with defaulted obligations that are not fully worked out at the termination of the credit protection deed. These losses will reflect Santander's accounting provisions. The risk of inflated losses based on Santander's accounting provisions is however limited to obligations that default within the 5.5 years prior to the legal final termination date.

Santander's loss claims can survive the termination of the credit protection deed in the case of exposures that have potentially defaulted prior to the termination.

4.3. External verification of losses

The credit protection agreements grant significant supervisory rights to an external verification agent, a reputable global accounting firm. This agent ensures the validity of all loss claims (for initial and final losses) and determines whether the final-loss figures comply with Santander's internal policies. Santander must also demonstrate to the verification agent that its servicing and work-out processes are in accordance with the bank's internal business principles and policies.

4.4. Amortisation and loss allocation

The reference portfolio losses are allocated to the tranches in reverse order of seniority, i.e. from Tranche G to A. Upon default, a loss equal to 35% of the defaulted reference obligation will be allocated to the tranches, up to the respective outstanding balance of the affected tranches. The allocated loss is then adjusted (up or down), depending on the realisation of recoveries over time. A too-high initial loss results in a balance reinstatement of the loss-attached tranches in order of seniority. A higher final loss results in a further write-down.

With respect to the credit protection premiums, Red 2 is compensated as though initial loss equals realised loss. There will be a marginal time-value-of-money loss. Both Santander and Red 2 will not pay interest on the credit protection premium that was not paid or received in excess.

Amortisation of the reference portfolio will be reflected in a release of credit protection in order of seniority.

4.5. Events of default and credit protection termination

The structure features default and early-termination events that trigger the termination of the credit protection deed (see Figure 19).

Figure 19: Events of default and early termination

Events of default
Non-payment of due amounts by either of the two parties to the credit protection deed
Breach of reporting obligations by Santander, subject to a 10-day grace period
Insolvency

Early-termination option
Illegality
Payments from either party are subject to taxes, others than currently applicable
Reference portfolio amortises to below 10% of the closing portfolio
Regulatory changes may impair the efficacy of the credit protection agreements

Source: Scope

5.   Ratings

Scope has assigned ratings to the credit protection agreements (Tranches A to F) as shown in Figure 20. The ratings reflect each tranche's protection against losses from the reference portfolio as well as the strictly sequential release of credit protection alongside reference portfolio amortisation.

Figure 20: Assigned ratings

Credit protection agreement	Rating	Weighted average tranche life[5]	Credit enhancement
Tranche A	AAA_{SF}	2.1	18.00%
Tranche B	$AA+_{SF}$	3.7	14.25%
Tranche C	$A+_{SF}$	3.9	10.00%
Tranche D	A_{SF}	3.8	8.00%
Tranche E	BBB_{SF}	3.9	5.30%
Tranche F	BB_{SF}	3.8	3.00%

Source: Scope

We tested the resilience of each tranche under every rating-conditional loss scenario derived from the portfolio analysis.

The rating of Tranche B also accounts for its high dependency on the expected recovery. Scope considered the volatility of each tranche's quantitative results to changes in the recovery rate that is not commensurate with the highest achievable rating (see 5.1 Rating stability).

Ratings consider rating-conditional loss rates

The results of the loss allocation analysis are shown in Figure 21, which also illustrates the rating-conditional loss rates and the break-even portfolio loss rates.

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[5] The weighted average tranche life reflects both principal and interest payments under a 0% default assumption and the higher coupon payments on Tranche D impacts its weighted average life.

Figure 21: Tranche losses for all rating-conditional portfolio loss rates
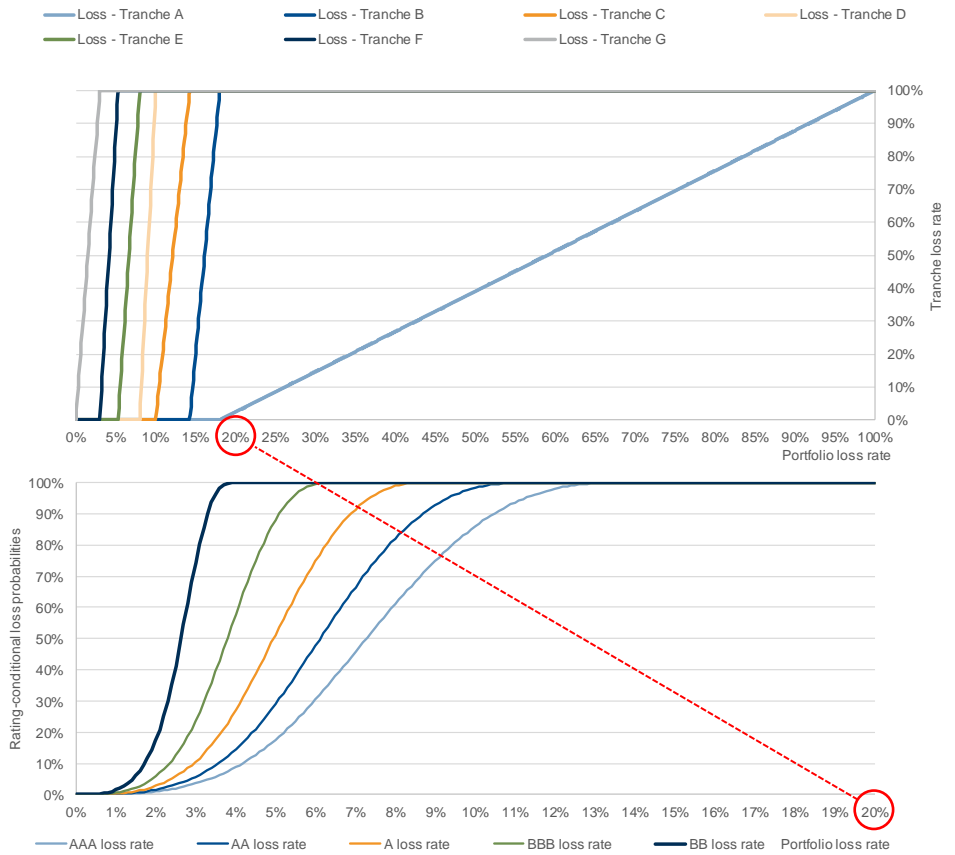
Source: Scope

Ratings account for collateral release and tranche premiums

The losses for the tranches in Figure 21 only reflect the loss of principal payments for the respective tranche and do not account for discounting effects. However, the assigned ratings take into account the assigned tranche premiums.

5.1. Rating stability

5.1.1. Rating sensitivity

The stability of the ratings is supported by i) the protective mechanisms in the structure and ii) Scope's use of both rating-conditional recovery rate assumptions and a long-term performance reference for the assets, capturing post-Brexit stresses.

Scope tested the resilience of the ratings

Scope tested the resilience of the ratings against deviations of the main input parameters: tenant quality (as a driver of portfolio default) and the portfolio recovery rate. This analysis has the sole purpose of illustrating the sensitivity of the ratings to input assumptions and is not indicative of expected or likely scenarios. The following shows how the results for each rated tranche change when the tenant credit quality reduces by three notches or the portfolio's expected recovery rate reduces by 10%, respectively:

- Tranche A: sensitivity to lower tenant quality, zero notches; sensitivity to recovery rates, zero notches;

- Tranche B: sensitivity to lower tenant quality, zero notches; sensitivity to recovery rates, three notches;

- Tranche C: sensitivity to lower tenant quality, zero notches; sensitivity to recovery rates, five notches;

- Tranche D: sensitivity to lower tenant quality, zero notches; sensitivity to recovery rates, six notches;

- Tranche E: sensitivity to lower tenant quality, zero notches; sensitivity to recovery rates, four notches;

- Tranche F: sensitivity to lower tenant quality, one notch; sensitivity to recovery rates, six notches.

6.   Counterparty risk

The credit protection agreements have limited counterparty risk to Santander

Credit protection premiums by Santander and potential recoveries proceeds expose the issuer to limited counterparty credit risk. This is mitigated through i) the high credit quality of Santander; ii) netting of payments between Red 2 and Santander; and iii) the very limited exposure. Scope has a public rating on Banco Santander SA (AA-/Stable/S-1+) and has also analysed the credit quality of Santander UK plc.

In our analysis, we applied the principles defined in Scope's 'Methodology for Counterparty Risk in Structured Finance', available on www.scoperatings.com.

7.   Sovereign risk

Sovereign risk does not limit the ratings

Sovereign risk does not limit the ratings on this transaction. Scope's AA / Negative Outlook rating on the UK takes the risks of an institutional framework meltdown and legal insecurity into account, although we do not anticipate a 'no-deal Brexit' or a hard landing.

Scope still considers the most probable outcome to negotiations with the European Union to be a 'soft Brexit' (Scope's baseline) or a 'no Brexit'. The possibility of a 'hard Brexit' will, however, remain central to the public discourse in the period ahead. Our analysis includes the likely contraction of CRE prices resulting from post-Brexit scenarios. We expect several macroeconomic factors to challenge the development of CRE prices.

UK economic growth is anticipated continue weaker than the 1.7% for 2017 as investment decisions are postponed until the effects of Brexit can be quantified, and we expect conditions to worsen as long as Brexit-related uncertainties remain. Retail and residential properties will suffer particularly, as inflation, at a current level of 2.7% year-on-year, constrains real consumer spending expansion. Furthermore, the trade sector is also vulnerable, reflecting the dependency on imports and the insufficient actions to repair deficiencies in international competitiveness. Most external balances are deeply negative. However, the strong depreciation of the pound, as a reaction to Brexit, might mitigate some of these effects.

Industrial properties are also under pressure, now that the UK is faced with a shrunken industrial base that has failed to improve productivity and profitability – with few exceptions.

8.   Legal structure

8.1.   Legal framework analysis

The credit protection agreements are governed by the laws of England and Wales. The transaction represents a synthetic risk transfer by means of financial guarantees to a bankruptcy-remote vehicle, represented by the trustee, Citicorp Trustee Company Limited.

No legal or tax question grants a specific analytical treatment in the rating analysis

Scope has reviewed and considered the legal and tax opinions produced by the issuer's legal and tax advisers, concluding that no legal or tax question grants a specific analytical treatment in the rating analysis.

9.   Monitoring

Scope will monitor this transaction from performance reports produced by Santander and any other information received from the originator. The ratings will be monitored continuously and reviewed at least once a year, or earlier if warranted by events.

Scope analysts are available to discuss the rating analysis in detail, the risks to which this transaction is exposed, and ongoing monitoring of the transaction.

10. Applied methodology and data adequacy

For the analysis of this transaction, Scope applied its 'General Structured Finance Rating Methodology', and 'Methodology for Counterparty Risk in Structured Finance'. Both are available on www.scoperatings.com.

I. Summary of portfolio characteristics

The following table shows the summary of reference portfolio characteristics and assumptions considered in Scope's analysis.

Figure 22: Tranche losses for all rating-conditional portfolio loss rates

Key features	
Cut-off date	15 October 2018
Balance at cut-off	GBP 2,785,000,000
Loans	837
Properties	2,871
Large loans (>5%)	0
Weighted average life (years)	2.8
Minimum / Weighted average (WA) / Maximum LTV (current)	10.5% / **49.0%** / 68.0%
Minimum / WA / Maximum LTV at maturity (Scope assumptions)	13.6% / **62.6%** / 89.7%
Weighted average unexpired lease term (years)	3.9
WA interest coverage ratio	3.0x
WA margin	(confidential)
Portfolio lifetime default rate	28.4%
Portfolio WA time to default (years)	2.4
WA base case recovery rate	95.0%

II. Commercial real estate loan analysis

Scope has applied the following framework to analyse commercial real estate loans in this transaction and produce assumptions to analyse the credit quality of each loan in the portfolio. Scope has generated two assumptions for each loan: the loan's default probability, over its term and at maturity, and the recovery rate upon default (Figure 23).

Our fundamental analysis of risk is performed in the following order: i) tenants and tenancy contracts, ii) properties, and ii) the loan characteristics. Each phase of the analysis builds on the results from the previous phase, i.e. bottom-up approach. This analysis takes into account the originator's strategic positioning in the market, the consistency of this positioning with its risk appetite, and the characteristics of the credit products it originates.

The diagram in Figure 23 also shows the analytical steps used to derive the expected loss on a loan. Scope calculates projections of cash flow available to service the loan.

Stressed cash flows over a loan's life influence the probability of a loan defaulting before its maturity, i.e. the term default probability; while the property's market value drives refinancing risk, the probability of a loan defaulting at maturity, i.e. the refinancing default probability, and the severity of default. Refinancing risk is essential to the transaction because commercial real estate loans typically do not fully amortise.

Our analysis is based on the available cash generated by rent (net of operating expenses) and by potential workout proceeds. The cash available to repay both the loan and the market value of underlying properties is stressed under rating-conditional scenarios (i.e. the higher the target rating scenario, the higher the stress). We derive the level of rating-conditional stress from previous commercial real estate cycles observed in the relevant market and in Europe.

Figure 23: Analytical framework for commercial real estate loans
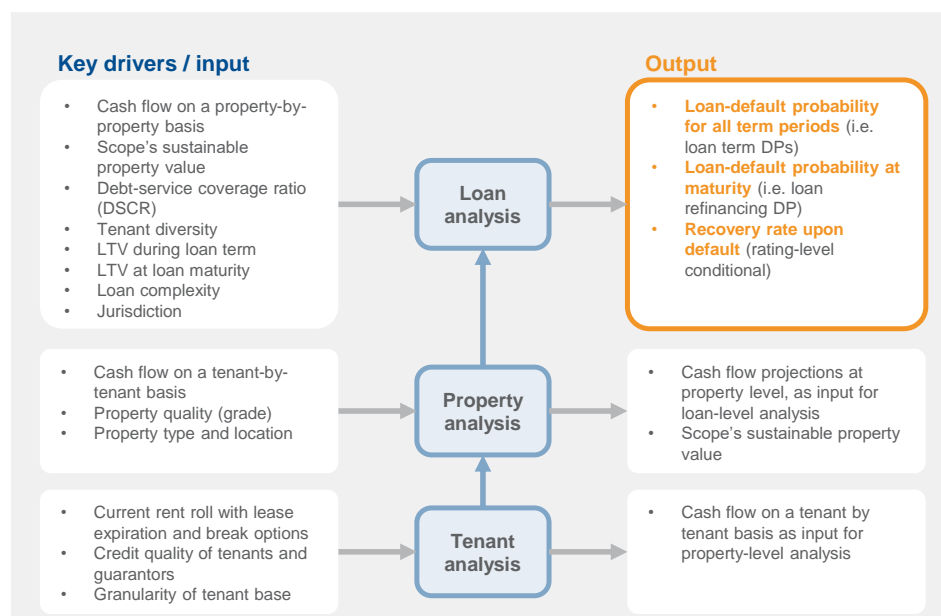
Source: Scope

Rental income is the main factor used to derive a loan's default probability and recovery rate, as it drives both the ability to service a loan (term default probability) and the property's sustainable value. The sustainable value is used to derive refinancing default probability and loss given default.

The framework applies to most commercial property types found in typical commercial real estate loans, such as office, retail or industrial properties. A typical commercial real estate loan benefits from a mortgage security over the finished properties as well as pledges on rental income. The framework is not applicable to the analysis of portfolios backed by commercial real estate construction loans or project-development loans.

10.1. Tenant analysis

Scope has analysed the current rent roll for all properties that secure a given loan. We have then used the assumptions derived from the rent-roll analysis to forecast the cash flow available to service future debt instalments. Scope has analysed the quality of tenants in a given property by considering their creditworthiness. Tenant quality drives the term default probability.

The second-most-important factor driving property values and loan default is the likelihood of a tenant exercising break options on a lease. Break options also worsen the risk of property vacancies during a market downturn. We also consider the likelihood of a lease's renewal upon its expiry.

10.1.1. Creditworthiness of tenants

Scope followed a standard approach based on the one-year default rates of companies in the UK, also because the tenant base is relatively granular.

Our cash flow projections on a property have incorporated the default of tenants, the corresponding vacancy periods, and corrections in rent after a lease contract's termination. We implemented a dependency framework between tenant defaults using conservative group and industry dependencies.

10.1.2. Lease expiries and break options

Scope has also analysed the factors that would affect a tenant's decision to either remain in a property or exercise a break option. Such factors are: the level of competition on the local market (i.e. supply versus demand for the property's type and location); contractual rental levels compared to the local market average; and characteristics of the tenant's line of business.

Scope believes a property's risk of vacancy increases when the region of its location also has a high rate of vacancy. This risk also increases when the nature of a tenant's business allows the option to vacate a property when the lease expires, which is common among law or consultancy firms.

If the tenant base is relatively granular, Scope derives its assumptions on tenant behaviour – at lease contract expiry or when a break option is used – by comparing contractual rent with the current market level, i.e. the estimated rental value (ERV). We assume a lease will be terminated if a tenant's rent is more than 10% higher than the estimated rental value. Conversely, we assume a tenant is more likely to extend a lease if the rent is fairly priced or under market rate.

10.2. Property analysis

Scope's property analysis looks at a property's characteristics and quality – which results in a property grade – and the local property market's characteristics and condition. These factors influence our cash flow projections and view on a property's sustainable value.

10.2.1. Property grade definition

Scope has assigned a grade to the properties securing the reference loans, representing the quality of the properties. The highest property grade is PG1, e.g. a prime landmark building in a micro/macro location ideal for its usage type. The lowest is PG5, e.g. a property in poor condition in a degraded or undeveloped/unconsolidated location. Certain

assumptions are associated with the property grade and reflect on the cash flows a property can generate sustainably. The grade is also used to infer the property's sustainable value.

The property grades take into account a property's distinct characteristics i.e. type, location and attributes. Property grades reflect the properties' condition and attractiveness to the market by examining: i) maintenance costs and capex (historical and expected); ii) vacancy rates (historical and expected); iii) micro and macro location; iv) age; and v) the expiry profile of lease contracts. We use information from: i) on-site visits; ii) valuation reports from established industry experts; and iii) market studies from reputable sources.

Figure 24 shows the weights Scope has applied to the fundamental drivers of property quality in order to derive the property grade ranking.

Figure 24: Scope's indicative weights to derive property grades

Property attributes	Weight	Ranges
1. Location		
1.1 Micro location	20%	Very attractive to poor micro location, on a 1-5 scale
1.2 Macro location	20%	Very attractive to poor macro location, on a 1-5 scale
2. Property condition	20%	New or fully refurbished to poor, on a 1-5 scale
3. Property quality	20%	Luxury to poor, on a 1-5 scale
4. Lease expiry/break option profile	20%	Very long to very short weighted-average unexpired lease term, on a 1-5 scale

Source: Scope

The property grade has a significant impact on the estimated sustainable property value. This is because the property grade affects projected cash flows and sustainable yield, which are factors used to determine the level and volatility of the sustainable property value. The higher the property grade, the more stable the sustainable value.

10.2.2. Market environment

Market attractiveness for a property type influences: i) prices and rental levels; ii) volatility of prices and rental levels; iii) property yields; and iv) take-up[6].

Rental level development. Scope adjusts rental levels upon the expiry of leases if these deviate from the estimated rental value. We derive estimated rental values for the respective sub-markets using benchmarks and market research from reputable public and private sources such as the Investment Property Database.

Duration of vacancy periods. The duration of a vacancy after a lease is terminated is a function of both the average lease length in a specific market and the peak vacancy rate observed in the last cycle. This base assumption applies to property grade PG3. The property-specific assumption is a result of upward adjustments for lower-quality properties, i.e. PG4 or PG5; and vice versa for PG1 or PG2.

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[6] Newly rented space, typically in square meters, for a given property market or submarket in a given period of time.

Figure 25: Calculation of vacancy periods for the UK and property grade PG3

	Residential	Office	Retail	Industrial	Other
Average lease duration (months)	120	120	150	120	90
Structural vacancy rate	3%	8%	13%	9%	6%
Vacancy period for a PG3 property (months)	4	10	20	11	5
Adjustment for property quality	PG1 PG2 PG3 PG4 PG5	-50% -25% 0% +25% +50%			

Source: Scope

Re-letting likelihood. We have assumed that re-letting after a lease's termination is generally possible. However, the likelihood can be limited by i) lease terms; ii) market vacancy rates; and iii) the property's quality. This is illustrated in Figure 26 and Figure 27.

Tenant behaviour upon lease termination or when break options are used depends on current lease terms and their relation with the estimated rental value. We assume that tenants would remain in a property at current conditions if a tenant's rent is not 10% higher than the estimated rental value, i.e. fairly priced or under market value.

We have assumed re-letting is possible, but after a vacancy period and subject to a rental-level haircut that equals the structural vacancy rate. These adjustments reflect the impact market vacancies have on the likelihood of re-letting and the terms of new contracts.

Scope has adjusted the applicable vacancy rate for the current market in line with the specific property grade, which reflects the property quality. We believe higher property grades increase the likelihood of re-letting as well as raise the expected rental value after re-letting (see Figure 26).

Figure 26: Derivation of re-letting rent level
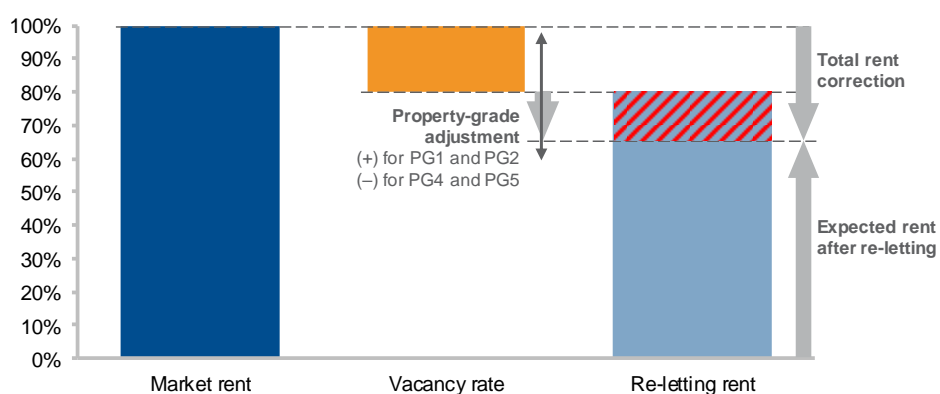
Source: Scope

10.2.3. Property cash flow projections

Scope has built its expectation of sustainable cash flow for each property and for every quarter over the life of the loan. Cash flow projections leverage on all previous stages of the analysis (i.e. tenancy analysis, market environment and property grade).

Scope has based its projection of periodic debt-service coverage ratios and interest coverage ratios on sustainable cash flows, rather than actual cash flow.
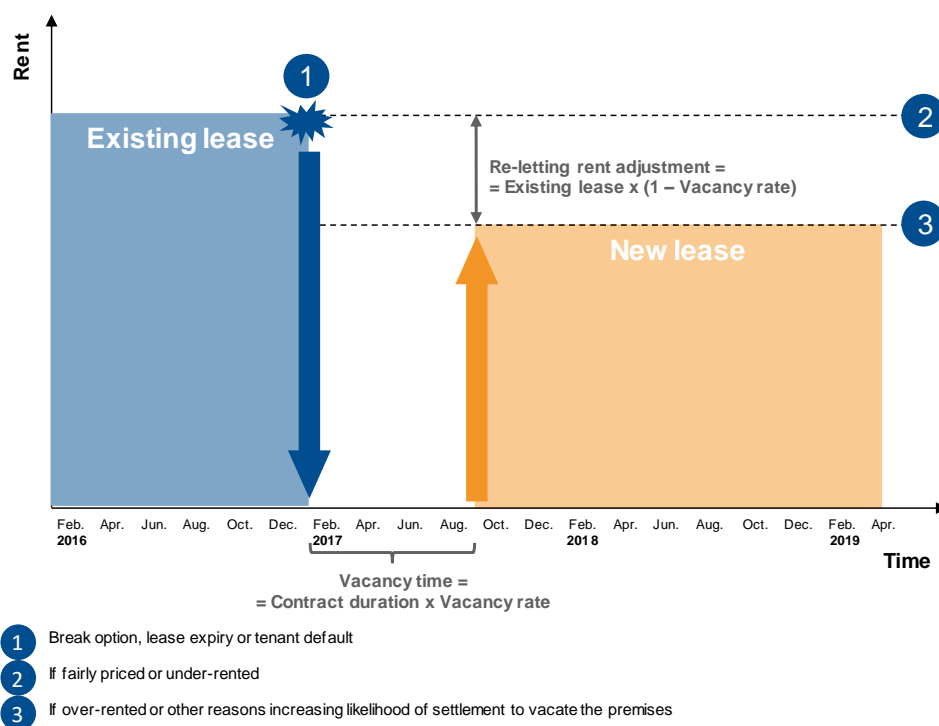
Figure 27 shows an example of events that might affect a property's cash flow over the life of a loan. A vacancy period will follow the termination of a rental contract upon tenant

default, lease expiry or the exercise of a break option. The vacancy period and the re-letting rental levels depend on the factors already presented.

Scope has combined cash flow available from all properties securing the loan and simulates tenant defaults, vacancy periods and re-letting leases.

Figure 27: Example - Sustainable cash flow of a property

1. Break option, lease expiry or tenant default
2. If fairly priced or under-rented
3. If over-rented or other reasons increasing likelihood of settlement to vacate the premises

Source: Scope.

10.2.4. Scope's sustainable property value

Scope has derived its projection of sustainable property values from a proprietary index that reflects the average evolution of UK property values. Scope determined a sustainable level for that index, which reflects Scope's expectations about UK CRE property prices in a post-Brexit scenario.

The index combines information on property prices from reputable sources of market research relevant for the sub-market and property type.

Scope uses the sustainable property value to calculate the sustainable loan-to-value ratio. The loan-to-value, in turn, enables Scope to calculate the severity of loan defaults and the refinancing default probability.

10.3. Loan analysis

Scope has calculated the default term structure (i.e. the time distribution of default probabilities) in the loan-analysis phase. The default term structure of the loan reflects: i) term default probability; and ii) refinancing default probability.

Scope also estimates the severity of loan defaults during the loan-analysis phase. Expected loss upon default is driven by the asset's loan-to-value ratio.

10.3.1. Term default probability

The aggregated sustainable cash flows for each property represent the amount available for interest and principal payments on a given loan. This is reflected in the expectations for debt-service coverage ratio (DSCR) or the interest coverage ratio (ICR).

Scope's analysis has generally accounted for loan characteristics such as strong covenants and hedging. Scope deems a loan as defaulted if cash flows are insufficient to service debt. We have determined the probability of default for every period over the life of the loan, which captures tenant defaults, vacancy periods and the adjustment to rent after a property is re-let. In general, a higher DSCR/ICR provides a better cushion against deteriorating cash flows which could ultimately lead to a default of a loan.

Figure 28: Tenant defaults and lease termination drive term default probability
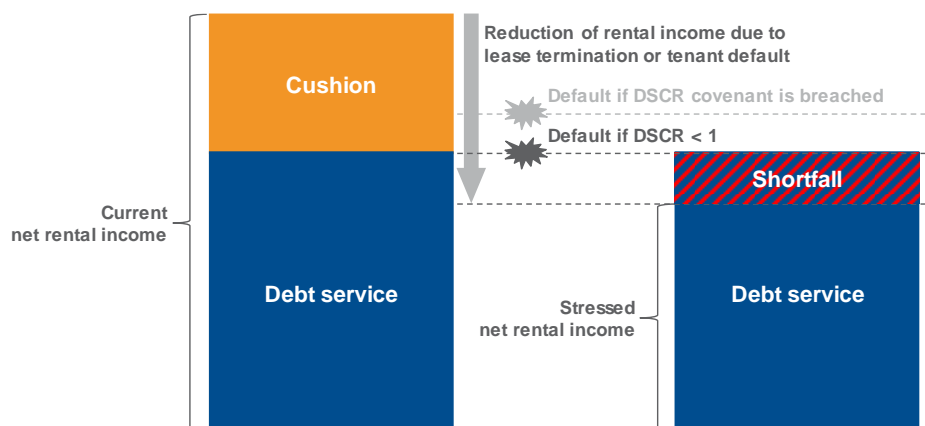
Source: Scope.

Scope analyses the loan documentation to adjust general assumptions such as recovery timing or recovery costs. A high likelihood of support from the loan sponsor could also reduce the loan's credit risk, for example, when the sponsor provides significant equity for the property.

10.3.2. Refinancing default probability

The risk of the failure to refinance outstanding debt at the scheduled maturity increases the default probability at the end of the contract. Generally, the larger the balloon component of any partially amortising loan, the greater the risk. This risk is highest for bullet loans.

The main driver of refinancing default probability is the expected loan-to-value at maturity, (exit LTV). Other factors also contribute: loan features, property type, property grade, and market conditions at refinancing.

Scope's expectation of the exit LTV reflects expected contractual amortisation during the life of the loan. The expected exit LTV is the total outstanding loan amount expected at maturity divided by Scope's assumption on expected sustainable property value.

At maturity, Scope deems a loan as defaulted when the property's value is lower than the loan's outstanding balance, i.e. when the exit LTV is above 1. The actual value of the property when a loan matures is a random variable that may deviate from the expected sustainable property value.

Refinancing default probability is higher for properties with low property grades and equates to the probability that the loan's outstanding balance at maturity exceeds the sustainable property value. This effectively uses the Merton approach to analyse default at the point of refinancing. The volatility of the sustainable exit property value is a function of the property grade.

Figure 29 illustrates typical default probability curves at loan maturity for varying exit LTV levels and property grades. Scope assumes that for an average-quality property (PG3), a lender would be indifferent about refinancing a loan with an exit LTV of 78%, i.e. equal likelihood of either default or successful refinancing. Scope uses similar curves to derive

the market-specific tables indicating the refinancing default probability for a given exit LTV and property-grade pairs.

Under an alternative view, defaults occur when a borrower cannot provide sufficient equity for the loan. Equity contribution is essential for commercial real estate financing. Lenders require more equity on loans that finance lower-quality properties. The maximum loan amount that can be refinanced depends on the property grade.

Figure 29: Refinancing default probabilities as a function of exit LTV and property grade
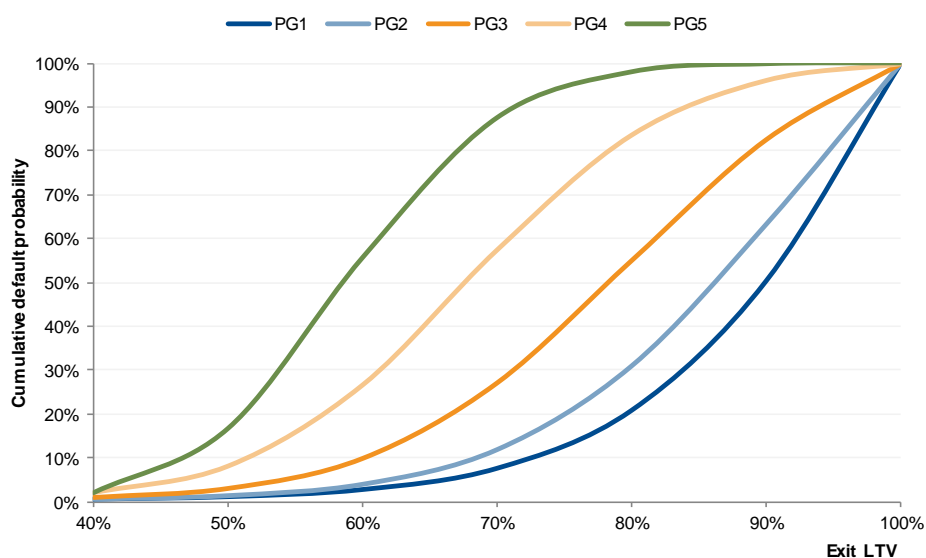
Source: Scope.

We have analysed the volatility of property values with a process[7] that captures adverse-value paths over the life of the loan. Scope's forecast of a property's value, or the expected exit value, equates to its sustainable value. The longer the life of the loan, the higher the chance of adverse-value paths, and the more dispersed the probability distribution of exit values. We typically construct refinancing default probability tables over the average duration of loan contracts in that market, i.e. five years for the UK.

Figure 30 illustrates how Scope derived the loans' refinancing default probability using the cumulative probability distribution of property values at maturity as well as relevant break-even values. Scope assumes loan default when the property value falls below a level derived from the rental cash flow analysis, i.e. break-even value. The break-even value is calculated using the loan's outstanding balance at maturity and the indifference exit LTV of lenders for the corresponding property grade. This is represented by the following expressions:

$$Refinancing\ DP = probability\{property\ values\ < Break-even\ value\}$$

where

$$Break-even\ value = Balance_{maturity} \times Indifference\ exit\ LTV|_{property\ grade}$$

A property value below the break-even line (red shaded area in Figure 30) would result in a loan defaulting at maturity because it is impossible to refinance outstanding debt at the maturity date. Figure 30 also shows that the refinancing default probability increases when

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[7] Ornstein-Uhlenbeck process with drift.

the risk horizon is longer (i.e. increasing the risk horizon from five to 10 years increases the probability that property values will fall below the break-even threshold).

Figure 30: Example of derivation of refinancing default probability (cumulative probability of property values and relevant value-thresholds)
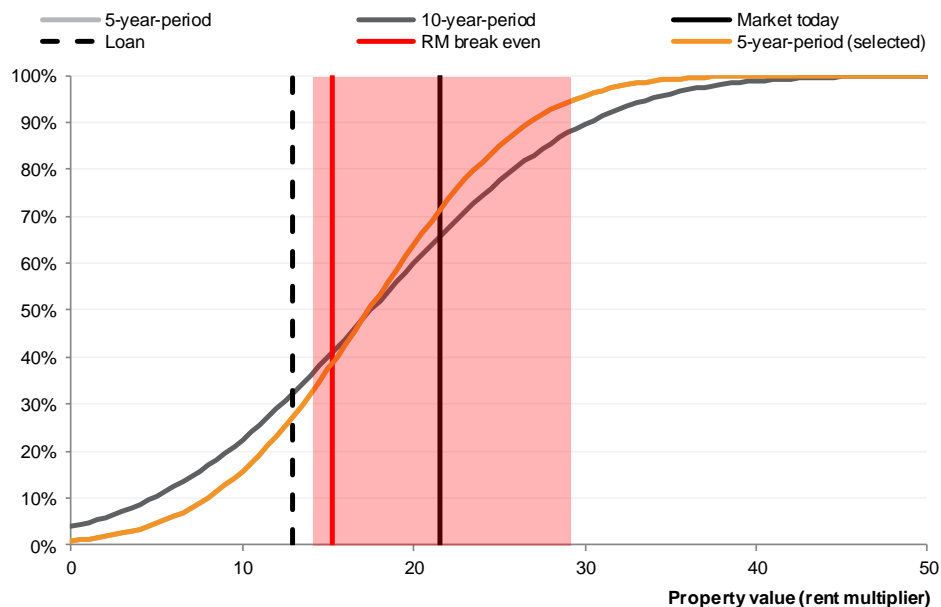
Source: Scope.

Finally, high debt yields make it more likely that a lender will refinance a loan. The debt yield equals the sustainable cash flow divided by the loan's expected balance at maturity. The debt yield is the maximum interest rate that the sustainable cash flow can support. For example, a loan with a debt yield of 8% can only support refinancing at an interest rate of up to 8%; a higher interest rate would result in interest coverage ratios of below 1.

10.3.3. Recovery rate

Scope derived the recovery assumptions for severity calculations from foreclosure analysis. We have assumed property foreclosure will occur during a recovery process, even though refinancing into a new loan contract after a default is often more likely. Consequently, the money recovered after default is the net amount received after the enforcement of the mortgaged security. The recovered amount is net of enforcement costs and any claims that rank senior to the loan being analysed.

Recovery rates take into account the expected property value at maturity, subject to the following adjustments: i) distressed-sale discounts; ii) claims against security value that rank senior to the loan; iii) claims against the security value ranking pari passu to the loan; iv) any break-up costs (debt or hedging derivatives); and v) the time and cost of the enforcement process.

We believe distressed-sale discounts are a function of the property grade. High-quality properties in liquid markets are, all things being equal, in higher demand, and therefore the expected distressed-sale discount is lower than that affecting PG5-grade properties in rural locations. Figure 31 shows the recovery costs that Scope assume for the analysis.

Figure 31: Indicative recovery costs

Property grade	PG1	PG2	PG3	PG4	PG5
Distressed sale discount	10.0%	15.00%	20.0%	25.00%	30.0%
Liquidation costs (incl. timing)					
Fix (%age of outstanding loan)	*5.0%*	*7.5%*	*10.0%*	*12.5%*	*15.0%*
Variable (%age of properties market value)	*7.5%*	*7.5%*	*7.5%*	*7.5%*	*7.5%*

Source: Scope.

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Commercial real estate

Scope Ratings GmbH

Headquarters Berlin

Lennéstrasse 5
D-10785 Berlin

Phone +49 30 27891 0

London

Suite 301
2 Angel Square
London EC1V 1NY

Phone +44 203-457 0 4444

Oslo

Haakon VII's gate 6
N-0161 Oslo

Phone +47 21 62 31 42

info@scoperatings.com
www.scoperatings.com

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 95
Edificio Torre Europa
E-28046 Madrid

Phone +34 914 186 973

Paris

33 rue La Fayette
F-75009 Paris

Phone +33 1 82885557

Milan

Via Paleocapa 7
IT-20121 Milan

Phone +39 02 30315 814

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