FitchRatings

EMEA CMBS and CRE Loan Rating Criteria

Sector-Specific

Scope

This report details how Fitch Ratings analyses new and existing EMEA commercial mortgage loans, commercial mortgage-backed securities (CMBS) and equivalent property interests (eg credit tenant leases, ground leases, 'income strips', etc). The criteria apply to markets with a record of commercial real estate (CRE) investment, a range of debt originators, a deep base of occupiers, and a reliable legal system underpinning the mortgage security.

These criteria are also applicable in APAC market segments with rental and yield data covering at least 10 years, provided they are sufficiently comparable to those in EMEA based on e.g. property market pricing and leasing conventions. In these circumstances, Fitch will apply the methods described in these criteria to determine rating assumptions, otherwise the *CMBS Large Loan Rating Criteria* will apply.

Collateral ranges from leased CRE – retail, office, industrial – to operating assets, such as hotels, professionally managed residential portfolios and student accommodation. The approach to operating assets (not only those mentioned above but also those such as untied UK pubs and car parks, including leased assets) is subject to the availability of relevant market data, unless exposures are small enough to warrant mapping to the market/sector offering the next best use.

Key Rating Drivers

The following is a list of the key rating drivers in order of relevance to Fitch's analysis.

Real Estate Risks: Fitch's assessment of the collateral quality of mortgaged property and its absorption of wider market characteristics (and for certain operating assets, concentration) is combined in rating assumptions covering income and value. These assumptions cover structural vacancy (SV), rental value decline (RVD), holding costs (capital and irrecoverable operating costs), capitalisation rates, work-out costs and recovery timings.

Loan Features: Scheduled amortisation, release pricing and borrower-level hedging can modify credit risks related to refinancing, adverse property selection and interest rates. The effects of such features are considered in Fitch's loan analysis. We assume the exercise of contractual loan maturity extensions. If senior loan purchase options held by mezzanine lenders last until mortgage enforcement, the junior note rating is typically one notch lower.

Note Structure: Principal and interest payments to noteholders are tested according to the paydown rules of the bond waterfall. Structural features, such as external liquidity, issuer-level hedging and tail periods (between loan and note maturity), can mitigate the impact of real estate risk on note performance.

Where excess spread can be paid as note principal for defaulted loans, any consideration is limited to senior notes given that sequential allocation of recoveries reduces excess spread, unless a rise in issuer funding costs is not relevant (e.g. for single property CMBS), supporting excess spread credit for all notes.

Loan Enforcement: When calculating collateral liquidation proceeds, Fitch deducts acquisition costs, selling costs and any senior liabilities identified from any review of either technical, environmental or title concerns in relation to the underlying properties, or as a result of contingent liabilities and/or weaknesses of the security package. Where liquidation is enforced, Fitch also deducts foreclosure costs and assumes a recovery delay. Assumptions applied are described in Appendix 7.

This report replaces the *EMEA CMBS and CRE Loan Rating Criteria,* dated 16 December 2022.

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Counterparty Considerations: Fitch applies its *Structured Finance and Covered Bonds Counterparty Rating Criteria* to assess if CMBS are isolated from counterparty insolvency risk.

Analytical Framework

Fitch's key rating drivers contribute to an assessment of the overarching credit constraint, namely refinancing risk, faced by borrowers. Fitch examines this risk by analysing the core factors that may alter CRE loan performance. These can be divided into five main categories.

Real Estate Risk

CMBS transactions and CRE loans are exposed to the performance of the underlying CRE that acts as loan collateral. Key performance variables include: the tenancy profile, judged on the stability of income; collateral quality, judged on both the level of income it is able to generate over its economic life and its related marketability to prospective buyers; the volatility of the investment and occupational market in which the collateral exists; and jurisdiction-specific property market standards, such as lease structures, real estate transaction costs and legal regimes.

Fitch's asset analysis measures the volatility in collateral performance along these variables. For each rating case, Fitch determines the stressed property value on the basis of stressed net rental projections (after RVD, SV and costs) and stressed capitalisation rates (cap rates). For further details, see the *Real Estate Risk* section of this report.

Loan-Level Risk

Loan terms and conditions add another layer of complexity to the asset analysis. The analysis examines how projected rental cash flows are applied in accordance with the loan waterfall on each payment date, as stipulated in the loan agreement.

Fitch analyses the loan terms and conditions and incorporates any relevant features in its projections. If, in the rating case, a loan does not default during its term, Fitch then compares its stressed property value at loan maturity (after contractual extension options) to the outstanding debt amount in order to determine if an orderly sale is achievable. If not, an enforcement process is assumed to commence. Before final resolution and recovery, additional costs are incurred and delays typically ensue, both of which affect the net recovery value. For further details, see the *Loan-Level Analysis* section of this report.

Liability Risk

EMEA CMBS transactions have historically been characterised by high exposure to a handful of large CRE loans. Lumpy, pre-payable loans, coupled with an uneven repayment schedule, explain the extensive use of non-sequential principal pay down structures in EMEA CMBS to date, as well as the frequent absence of excess spread-trapping mechanisms that are used in other asset classes.

Consequently, Fitch's liability analysis is mainly targeted at assessing the effect of pay down rules on credit enhancement (CE) on the one hand and the ability to service coupon payments on the other. In the absence of spread-trapping features, no credit is given to excess spread. Where excess spread does provide CE, Fitch considers this in its assessment of the senior notes, because this class can be considered well-protected from the impact of issuer cost of funds rising (and therefore excess spread falling) as loan recoveries are applied sequentially. When transaction features reduce the risk of margin compression (e.g. single property deals), Fitch extends this approach also to junior notes.

The only CE for non-senior noteholders recognised by Fitch as a defence against collateral underperformance is the subordination of junior classes and any reserve funds. Other structural (non-CE) support is provided by external liquidity that can cover note payment shortfalls. The size and mechanics of liquidity facilities are considered in our analysis. For further details, see the *Liability Analysis* section of this report.

Legal Risk

As with other structured finance transactions, CMBS deals and CRE loans are structured to isolate the collateral from the bankruptcy and insolvency risks of the other entities that participate in the transaction. Since in CMBS the sponsor of a loan is usually an operating

business of some description, not only the notes' issuer, but also the subsidiary borrowing entities are typically incorporated as bankruptcy-remote special-purpose vehicles (SPVs). Nevertheless, in most rating cases such borrower SPVs are assumed to become insolvent.

Given the two-step nature of CMBS structures, Fitch performs a loan-level as well as an issuer-level legal analysis. For any part of Fitch's analysis related to unmitigated legal risks in the transaction, Fitch adjusts its rating analysis as appropriate to reflect the added risk (if quantifiable, typically with greater costs/delays; otherwise, with rating caps).

Servicer/Operational Risk

Servicers, particularly special servicers, perform a pivotal role in EMEA CMBS. Given the above-mentioned concentration risk, the under-performance of a single loan can have a noticeable effect on a transaction. Pro-activeness and timely intervention by the servicer may determine the outcome of a CMBS deal to a very large extent.

For these reasons, Fitch pays particular regard to the contractual framework within which special servicing is carried out, to establish the degree to which a special servicer can pursue a favourable workout strategy without excessive interference from other parties, including specific note classes (or their representatives), or undue consideration to its own commercial interests. Where independence may be compromised, Fitch will modify its assumptions with regard to timing, costs and therefore recoveries, or by imposing a rating cap. For further details, see the *Servicer Risk* section of this report.

Transaction Data Provided to Fitch

The receipt of adequate transaction data is critical to Fitch's analysis. The absence of certain key items may result in the adoption of broader and more conservative assumptions, or in some cases may prevent Fitch rating the transaction. For new ratings, Fitch expects to receive the following information for its analysis.

- An overview of the transaction and the proposed structure.

- A completed loan-level questionnaire for each loan and transaction-level questionnaire (available on request).

- Comprehensive data tape of key loan and property-level fields (see Appendix 5).

- Recently completed third-party reports providing property appraisals, title, environmental and engineering reviews and detailed CRE market research for new jurisdictions and/or non-standard property types (e.g. operating assets).

- Borrower-level documents, including constitutional documents, loan agreements, hedging agreements, mortgage registrations, loan-level legal opinions, and inter-creditor agreements if applicable.

- Information on CRE sponsors and property managers.

- Issuer-level documents including transaction legal opinions.

In surveillance, if periodic reporting implies material changes in performance we will request updated property level information, e.g. tenancy schedule. However, it is not typical for due diligence reports or legal opinions to be available, or for new site visits to be held. As a result, unless new information comes to light (e.g. from servicer reports) or if Fitch has an updated opinion on particular credit risks, it will assume that its original analysis of those aspects still holds.

Investment Property and Hotel Assumptions

Rating committees are responsible for specifying all property assumptions used in assigning a rating to a given EMEA CMBS or loan. In setting assumptions for the cap rate, RVD/RevPARD (revenue per available room decline, for hotels) and, for investment property (in the office, retail and industrial sectors), market segment strength, the committee will refer to (but not be bound by) "guidance" assumptions maintained over time using the data sources described in Appendix 1. The aim of maintaining guidance assumptions is to support consistency without impinging on case-by-case judgments required to assess the unique qualities of individual commercial property assets.

Regular data reviews also help Fitch screen for changing market conditions that are relevant in surveillance. When Fitch does not have a comprehensive data set it will request data when ratings are assigned.

In jurisdictions covered by these criteria, we judge that the risks associated with sovereign credit are reflected in historical property market data. This judgement is supported (in most cases) by at least 20 years of market data covering several real estate cycles and periods of sovereign volatility. For example, countries that have seen higher volatility in their sovereign credit ratings typically display higher peak cap rates than those of more stable sovereign markets. Nevertheless, deterioration in sovereign credit quality, resulting in a multi-notch downgrade, could warrant revisions of the assumptions applied. Steep increases in bond yields and unprecedented austerity measures would be examples of sovereign deterioration that could lead to such a revision.

In calibrating guidance assumptions applicable in its stable and decreasing interest rate scenarios, Fitch examines property market data starting in 2000 covering prime rents and yields by individual market segment. The objective is to identify for each market a historical period whose combination of rental evolution and ending yield would, if repeated, represent the most severe value decline from the market's current Prime Value Basis (PVB). The PVB rebases the value of any representative prime asset in a given market by removing any overheating observed in prevailing market rents and yields (as we do in all our rating cases).

The 'Asf' guidance assumptions are an expression of value decline from the prevailing market value accounting for both the correction to PVB and the historically-identified value decline from PVB. This ensures we inform our analysis with market-specific historical volatility. However, markets can break away from historically-observed conditions and so we pay attention separately to the most recent rental performance for signs of potential deviation from a market's historical patterns. RVD guidance assumptions are adjusted to account for a market's Observed Rental Decline (ORD) over the last 18 months. The method of deriving rating-specific guidance assumptions for rents and yields in stable and decreasing interest rate scenarios is described in technical detail in Appendix 2.

In calibrating guidance assumptions applicable in its increasing interest rate scenarios, Fitch uses information from market segments extending back to 1990 to capture the effects that high interest rates registered in the 90s had on property market conditions, specifically yields. Such information from between 1990 and 2000 is used to calibrate a country-specific AAAsf multiplier which is then applied to the post-2000 peak yield for each market. We expect material interest rate increases to be in response to sustained inflation which, all things being equal, would imply a rental decline in real terms, making the prospect of nominal rental declines less likely. Therefore, we consider in our guidance RVD assumptions (in all rating cases) only the reduction needed to reach the market's PVB Rent (current trend rent) level. Please see Rental Value Decline (RVD) and Capitalisation Rates for detailed explanation.

For market segment strength scores, guidance assumptions are informed by the characteristics of the local property market. A strong market segment is one dominated by higher quality stock (protected by planning laws), served by high-value infrastructure for the use-type, and supported by a deep bedrock of occupiers loyal to their market cluster: it has high tenant "barriers to exit" and typically also high land values. Conversely, a weak market segment offers predominantly generic/mediocre (i.e. replaceable) accommodation (relatively unprotected by planning laws), limited infrastructure and a transient array of tenants. It lacks high tenant barriers to exit or land values. Where we have less than 20 years of rental or yield data we have less visibility about the market segment's historic performance. Therefore we reflect the greater uncertainty associated with shorter coverage with progressively higher base SV settings (see Structural Vacancy Floors).

Some market segments, particularly large regions, cover a very large range of location types; e.g. a town in a large region may have more in common with metropolitan market segments, in spite of geography. Fitch uses the market segment it considers most representative of the property to apply assumptions, adjusting position-in-market assessments accordingly.

For investment property, scoring collateral quality (from '1' to '7') is performed in relation to position-in-market and property grade, using information presented from the on-site review, the valuation report, and wider research. Rating assumptions for SV applicable to investment

property are the result of assessments of collateral quality and market segment strength and vary by rating case.

For a description of how hotel property quality is judged, as well as a full description of the analytical framework applicable to hotels, refer below to Hotel Assets under the section titled When Is the Asset Analysis Different? For collateral outside the core investment property sectors/regions, Fitch will look to other data to set assumptions, e.g. for lodging and residential assets, management data related to historical financial and operating performance may be instrumental in the income analysis.

Criteria Disclosures

In our initial rating report or RAC, we expect to disclose the following assumptions:

- rental value decline assumptions;

- cap rate assumptions;

- structural vacancy assumptions;

- depreciation assumptions (unless equal to guidance assumptions);

- assumptions for acquisition/sales/foreclosure costs and recovery timing that differ numerically from those defined in Appendix 7; and

- fixed-cost assumptions for hotels.

In our RACs related to surveillance rating actions, Fitch will disclose material rating assumptions that differ from those at closing; and/or 'Bsf' recovery proceeds (or equivalent e.g. 'B' LTV, recovery estimates).

For some rating actions these assumptions may not be relevant (e.g. credit-linked transactions) and therefore no such disclosures will be made

Variations from Criteria

Fitch's criteria are designed to be used in conjunction with experienced analytical judgment exercised through a committee process. The combination of transparent criteria, analytical judgment applied on a transaction-by-transaction or issuer-by-issuer basis, and full disclosure via rating commentary strengthens Fitch's rating process while assisting market participants in understanding the analysis behind our ratings.

A rating committee may adjust the application of these criteria to reflect the risks of a specific transaction or entity. Such adjustments are called variations. All variations will be disclosed in the respective rating action commentaries, including their impact on the rating where appropriate.

A variation can be approved by a ratings committee where the risk, feature, or other factor relevant to the assignment of a rating and the methodology applied to it are both included within the scope of the criteria, but where the analysis described in the criteria requires modification to address factors specific to the particular transaction or entity.

Rating Approach

Fitch's initial rating process begins with an initial review of detailed collateral data and the proposed transaction structure. Where onsite property reviews form part of Fitch's initial rating process, we would generally expect to visit a sample, with particular focus on the larger, riskier and/or more unusual properties.

For new ratings, in case the servicer is unfamiliar to Fitch, the agency may perform an onsite review involving members of Fitch's Operational Risk Group; otherwise Fitch will refer to information provided periodically by the servicer. For granular multi-borrower CMBS, reliance on the originator's processes, policies and procedures may take precedence over performing bespoke loan-level analysis on each position, thus warranting an operational review. These reviews typically focus on understanding the originator's corporate risk profile, underwriting standards, credit risk management policies and servicing functions. To do this, Fitch first must establish the facts of the loan by undertaking a loan-level documentation analysis, paying

attention to the rights and obligations of each party to the loan documents as well as other features that may be relevant.

Following these initial steps, Fitch performs its CRE and loan-level analysis using its EMEA CMBS asset model, which allows various numerical assumptions to be applied to test the ability of collateral value and interest coverage to absorb various rating stresses.

For existing ratings Fitch will periodically update its analysis using its EMEA CMBS asset model (for the avoidance of doubt including disposal and prepayment analysis, if relevant), unless the prospect of a change in ratings is discounted by the degree of stability in collateral performance. This approach is only available for single loan CMBS with no scheduled amortisation or substantial change in collateral composition since the last model run, and no flexibility (e.g. property substitutions/disposals subject to LTV/ICR/debt yield (DY) tests.

For loan ratings, the willingness of the borrower to avoid foreclosure of the loan is of key importance. Tying equity up in collateral exposes the borrower/sponsor to the threat of losing control over its asset, encouraging efforts to be made to refinance the loan. In assessing the likelihood of a loan refinancing on voluntary terms (rather than defaulting), Fitch tests the adequacy of remaining borrower equity and interest coverage after a given stress has been applied. This approach constrains the rating assigned to a loan materially below that of a corresponding single tranche CMBS (one that could hypothetically have been issued to finance the loan), subject to adequate tail period and liquidity support. See the CRE Loan Ratings section for more details.

In contrast, CMBS ratings are constrained not by the risk of a single loan defaulting but (in spite of a loan default and after accounting for property disposal and prepayment risk) by the capacity of property cash flow, liquidity support and the minimum length of time until bond maturity to allow for continued CMBS debt service, pending recovery proceeds flowing after enforcing on security. Besides the credit enhancement, bond coupons and maturities, the main inputs to this part of the analysis are note principal allocation rules, senior fee expenses, liquidity support and other structural features (as detailed in the transaction's legal documents). For existing ratings, this part of the analysis is relevant only in the cases when Fitch runs its EMEA CMBS asset model during the monitoring of the ratings.

Transaction-level legal analysis should be provided as well and is expected to demonstrate that Fitch's assumptions are consistent with the actual legal structure.

Real Estate Risks

The key determinant of CRE loan default probability and loss severity – given creditors have recourse solely to the charged assets – is collateral performance. For EMEA CMBS that pool together heterogeneous, individually underwritten and often very large loans, any analysis based on generic loan default and loss rates is inappropriate. This distinguishes the analysis from that used for many other structured finance asset classes. Instead, an in-depth mortgage collateral analysis is performed using the EMEA CMBS asset model, that simulates projections of stressed property income and related loan performance over its term.

If, as is typical in EMEA CMBS, redemption of the loan at maturity depends on refinancing the collateral (if necessary via a sale), Fitch will estimate property values in its rating cases using the EMEA CMBS asset model. This model projects asset income and investor demand for income (i.e. yield), which together drive value. The two main drivers of real estate risk in Fitch's rating analysis are stresses to income and yield. In cyclical downturns, property income may fall and/or yields increase (the latter reflecting investor expectations of falls in future income). Fitch's guidance assumptions are informed by empirical evidence of a correlation of rental and yield underperformance recorded by individual market segments.

Income Analysis for Investment Property

CRE derives its value from the ability to generate income. The EMEA CMBS asset model analyses the contracted income phase (until first lease break) alongside letting potential. The various components of the income analysis are described below.

Contracted Income

Stronger tenancy profiles score highly on income granularity, lease lengths and/or tenant credit quality. The nature of the profile reflects not only quality, but also property type: while for traditional offices, granularity of income is generally difficult to achieve and may be compensated for by longer lease terms; for shopping centres, typically short-lease terms and relatively high tenant credit risk are offset by a granular tenant base.

For contracted income, the EMEA CMBS asset model gives a proportion of credit to a tenant's rental commitments on the basis of: (i) its credit quality (in relation to the rating case); and (ii) the share of contracted income (for the loan's collateral) accounted for by the lease (its share of rent). The interplay of these two factors in the analysis is more pronounced as tenant credit diverges at the upper limit of its share of rent. As the share of income approaches 100%, tenant credit approaches either(a) 100%, in rating cases up to and including the tenant's rating; or (b) 0%, in rating cases above the tenant rating.

As the tenant's share of income falls from 100%, the credit given to its contractual obligations moves in from the extremes. In rating cases no higher than the tenant's rating, as its share of rent falls, so does credit given to its lease income, reflecting the diversification benefit of more risk-bearing entities being pooled together. Such reductions in tenant credit are more gradual in more benign rating cases.

In rating cases above the tenant's rating, as its share of rent falls, conversely, its lease credit rises, reflecting here the thinning of tail risk associated with greater pooling.

The first two tables below show the percentage credit for the most granular pools, where each tenant's share of income represents less than 1% of the loan's contracted income, while the third table provides examples where a non-rated tenant's share of income rises above this level. This has been determined with reference to portfolio default rates over five years and 10 years, with the results anchoring the proportion of credit given to tenants with a theoretical 0% share of income. For example, credit to contracted income from a granular portfolio of 'A' rated tenants will be 95% in an 'Asf' rating case, while from a granular portfolio of non-rated tenants in a 'AAAsf' rating case it will only be 30%.

Leases with a remaining term (rounded to the nearest whole year) between zero and five years reference the five-year table below, while all other leases reference the 10-year table.

Tenant credit quality and share of rent drive analysis of contracted income.

% Credit to Contracted Income by Rating Case and Tenant Rating
(Five year)

	Tenant Rating						
Rating case	AAA	AA	A	BBB	BB	B	NR
AAA	95	92	90	90	68	48	35
AA	97	95	93	91	70	51	40
A	100	98	97	92	74	58	50
BBB	100	99	98	94	77	65	60
BB	100	100	99	96	85	75	70
B	100	100	99	97	93	85	80
CCC	100	100	100	99	98	95	90

Source: Fitch Ratings

% Credit to Contracted Income by Rating Case and Tenant Rating
(10-year)

	Tenant Rating						
Rating case	AAA	AA	A	BBB	BB	B	NR
AAA	92	90	87	79	56	38	30
AA	96	94	92	84	61	42	35
A	99	97	95	87	65	50	45

% Credit to Contracted Income by Rating Case and Tenant Rating (Cont.)
(10 year)

	Tenant Rating						
Rating case	AAA	AA	A	BBB	BB	B	NR
BBB	100	98	96	90	69	60	55
BB	100	99	97	93	80	70	65
B	100	100	98	95	88	80	75
CCC	100	100	100	98	95	90	85

Source: Fitch Ratings

% Credit to Contracted Income for a Portfolio of Non-Rated Tenants by Rating Case and Concentration
(Five year)

	Tenant concentration (%)		
Rating case	<1	5	10
AAA	35	23	0
AA	40	28	0
A	50	38	0
BBB	60	48	10
BB	70	58	20
B	80	68	30

Source: Fitch Ratings

This standard analysis applies day one adjustments to contracted income. In some cases, a more nuanced analysis of tenant default timing may be warranted by the nature of the debt and rent roll. For longer-dated loans with substantial scheduled amortisation secured on properties with long leases to a small number of high-quality tenants, Fitch's Portfolio Credit Model may be run to derive a bespoke tenant default projection in different rating cases. Similarly, for granular loan portfolios, tenant default timing and credit to contracted income assumptions may vary depending on the rent roll, loan and paydown mechanics.

In the majority of cases, Fitch expects full rent rolls and unit-by-unit information (for data requirements see Appendix 5) to assign (and in many cases also to maintain) ratings. If unit-by-unit information is not available, Fitch will allocate property income and costs to units pro rata by surface.

For each unit, the relevant tenant credit is applied to the corresponding lease payments for the duration of the contract (weighting only those uplifts that are fixed). The residual proportion of the lease which is given no credit is treated as lettable space capable of earning market rent, less the stresses described in the following sections (RVDs, SV, higher holding costs). If the sum of these market stresses produces more income than the (highly under-rented) lease, 100% tenant credit is given.

As a rule, more concentrated portfolios, comprising weaker credits on shorter leases, are vulnerable to a steeper pace of decline in passing income in Fitch's rating analysis. As time progresses in the projection, net rental income falls as leases – and also therefore tenant credits – roll off, and the effect of Fitch's market stresses correspondingly grows, before net income stabilises at a level considered resilient in the face of the overall rating stress. Ahead of this outcome, loans with strong lease profiles may benefit from scheduled amortisation in Fitch's analysis.

New Lease Income
The source of new lease income is not specified, or treated as if it derived from a known tenant with a particular credit quality. Tenant credit therefore does not apply; rather the income is treated as stabilised income, net of various real-world risks (such as of falling market rents,

prolonged void periods, rising vacancy, and higher costs) and consistent with local market conventions (lease renewal probability, rent-free periods and lease lengths) – each calibrated for the particular property, in line with the given rating case. These stresses describe one side of the residual value analysis on which the credit quality of CRE loans typically hinges.

The method of modelling new lease income is not designed to be sensitive to, or reflect, the various dynamics responsible for income fluctuating over time: in CRE residual value analysis, predicting possible paths of property income is far less important than identifying a stabilised level around which the stressed income should vary. The starting point for this part of the analysis is the ERV. This indicates the estimated level of rental income that could be achieved if the unit were let in prevailing market conditions. This is typically assessed as part of the independent valuation of the property.

In markets where rents are reviewed frequently (e.g. in those characterised by short leases), current passing rent may be the most reliable estimate of ERV. Retail units are increasingly subject to some element of turnover rent, often floored at a particular base rent – ERV will represent a proportion (no higher than 100%) of what such leases would be expected to generate, for a typical tenant. Where the ERV becomes out of date (typically only relevant in surveillance rating reviews), Fitch may re-base ERV with reference to appropriate rental time series data covering the period since the last valuation date, Fitch will look to cross-check the outturn of this exercise against currently quoted rents per square metre for the same market segment.

Rental Value Decline (RVD)

In determining RVD (or RevPARD in the case of hotels) the ERV is permanently reduced by a factor, being both rating- and market segment-specific, comprising two components, both derived from historical rental data: (1) an adjustment to offset the current point-in-cycle ("PiC adjustment"), i.e. bringing market rent in line with a longer-term trend (the straight line that best fits the rental data), to which is added (2) a volatility component (applied to current trend rent). RVDs are meant to capture the cyclical nature of property markets by assuming a return to historical market conditions, calibrated at 'A'. RVDs are also subject to "Floors", to ensure a minimum margin of safety when the data suggests limited downside risk may apply, as explained in Appendix 2.

For decreasing and stable interest rate scenarios, Fitch's RVD guidance assumptions are derived in conjunction with its cap rates, as described in Appendix 2.

In increasing interest rate scenarios, guidance RVD assumptions for all property sectors (excluding PMRP and UK PBSA) are flat across ratings and equal to the higher of 2% and the PiC adjustment for decreasing/stable interest rate scenarios, reflecting the likelihood of rental inflation occurring prior to a significant change in monetary policy aimed at counteracting inflationary pressures. The rating committee may agree that higher RVDs are appropriate for certain properties that may be less sheltered from high interest rates. For instance, high interest rates may combine with higher RevPARD assumptions for prime London hotels dependent on revenue sourced from outside the sterling currency area.

As with other parameters for which these criteria provide "guidance", the rating committee is responsible for determining the RVD assumptions ultimately applied in the analysis.

Structural Vacancy (SV)

SV accounts for the proportion of ERV that is not earned from new lease income projected in Fitch's analysis (RVDs and SV are applied to ERV after deducting irrecoverable costs). At minimum, SV accounts for "frictional" vacancy generated between leases and for rent-free periods, in both cases as per norms in the market segment in question. In weaker market segments, SV may also reflect landlords' tolerance for vacancy in preference to lowering rents, as well as concerns about future oversupply.

SV is the sole factor in the rating analysis that reflects the relationship between income/value volatility on the one hand, and scoring of property quality and market segment strength on the other. As noted, available rental and yield data on which RVD and cap rate assumptions are based is generally limited to prime-quality property; SV compounds the resultant stress for lower-quality properties.

Available data on which guidance RVD and cap rate assumptions are based is limited to prime quality property; the SV compounds the resultant stress for lower-quality properties.

'Bsf' SV ranges from 5% to 10% based on the market segment. For the highest quality property, SV is fixed for all rating cases and reflects only those sources of economic vacancy that are common across the market segment in question. For weaker property, SV varies by rating case and also accounts for weaker income visibility associated with the property. At the limit, SV reflects obsolescence risk (property categories five and six have 100% SV in 'AAAsf' rating (and for category six also 'AAsf') cases, and very high SVs in high-investment-grade cases; property category seven has 100% SV for all rating cases, i.e. no value besides credit given to contracted income). The SV adjustment, in effect, generates the risk premium (for all but category one, geared up by rating case) that investors apply when discounting income from inferior quality property.

Note that SV is not intended to reflect the cyclical vacancy that emerges as a precursor to RVD as occupational markets enter downturns: since rental value in Fitch's analysis is assumed to remain at the market trough, corresponding to the applicable rating case, it reflects a market-clearing level at which economic vacancy is assumed to be essentially structural in nature.

The table *Property Score by Property Grade and Position-in-Market* shows the typical determinants of the property score, while the table *Structural Vacancy Multiplier by Property Score and Rating Case* shows the SV multiplier table applied to the base SV to account for a particular property score. The table *Examples of Structural Vacancy by Property Score and Rating Case* illustrates how these two determinants come together to gear SV assumptions (the example shows a strong market, where the base SV is 5%).

Property Score by Property Grade and Position-in-Market

Title	A (Best)	B (Good)	C (Peripheral)	D (Poor)
A (Good spec)	1	2	4	7
B (Fit for purpose)	2	3	5	7
C (Needs refurbishment)	3	4	6	7
D (In disrepair)	4	5	6	7

Source: Fitch Ratings

Structural Vacancy Multiplier by Property Score and Rating Case

	Bsf	BBsf	BBBsf	Asf	AAsf	AAAsf
1	1.0x	1.0x	1.0x	1.0x	1.0x	1.0x
2	1.4x	1.5x	1.7x	1.8x	1.9x	2.1x
3	2.1x	2.3x	2.6x	2.9x	3.1x	3.4x
4	3.0x	3.4x	3.8x	4.2x	4.6x	5.0x
5	4.5x	5.1x	5.8x	6.5x	7.2x	100%
6	6.7x	7.8x	8.9x	9.9x	100%	100%
7	100%	100%	100%	100%	100%	100%

Source: Fitch Ratings

Examples of Structural Vacancy by Property Score and Rating Case (%)

Property score	Bsf	BBsf	BBBsf	Asf	AAsf	AAAsf
1	5.0	5.0	5.0	5.0	5.0	5.0
2	7.0	7.5	8.5	9.0	9.5	10.5
3	10.5	11.5	13.0	14.5	15.5	17.0
4	15.0	17.0	19.0	21.0	23.0	25.0
5	22.5	25.5	29.0	32.5	36.0	100.0
6	33.5	39.0	44.5	49.5	100.0	100.0
7	100.0	100.0	100.0	100.0	100.0	100.0

Source: Fitch Ratings. Note: This table assumes base SV of 5%, which applies to the strongest market segments.

The "property grade" and "position-in-market" framework is broad enough to accommodate property idiosyncrasies (e.g. planned redevelopment may introduce uncertainty consistent with a weaker score) as well as sub-sector dynamics (e.g. cold storage facilities and data centres are both industrial in nature but differ in terms of drivers of supply and demand). As more information becomes available, we will consider certification against relevant "green" credentials as a distinguishing factor in our property grade assessment.

SV stresses are the main expression of Fitch's view about property quality. Even though they are applied to collateral income, their impact can be characterised as determining an "effective" prime yield (EPY), i.e. where the prevailing prime yield in the applicable market is adjusted for the 'Bsf' SV corresponding to the property score (prime yield / (1 – Bsf SV)).

As the EPY accounts for the same kind of qualitative and quantitative variables that influence the valuer's net reversionary yield (NRY), we consider it (the NRY) a suitable benchmark for the EPY implied by our property analysis (particularly when the property is well represented in the prime yield data). This helps us anchor our scoring of smaller property concentrations in granular portfolios.

Example of Benchmarking EPY Against NRY Based on Property Score

Inputs from applicable market	
Prime yield (a) (%)	6.0
Base SV (b) (%)	9.0
Analytical decision	
Property score	4.0
Calculation	
Structural vacancy multiplier[a] (c)	3.0
Bsf SV [d= b*c] (%)	27.0
EPY [e =a/(1-d)] (%)	8.2
Benchmark	
NRY (%)	8.0

[a] Based on the first two columns of the *Structural Vacancy Multiplier* table above
Source: Fitch Ratings

Structural Vacancy Floors

For market segments with data series (for rents or yields) shorter than 20 years, progressively higher floors to their base SV guidance assumption are applied, reflecting the reduction in available information regarding the historical cyclicality. The floor starts at 6% for time series shorter than 20 years, rising by 1pp for every two-year reduction in data-length, reaching a floor of 10% base SV for markets with 10 to 12 years' data. Fitch does not maintain customised guidance RVD or cap rate assumptions for market segments with less than 10 years' rental or yield time series data.

Data Length	≥20Y	[18-20) Y	[16-18) Y	[14-16) Y	[12-14) Y	[10-12) Y
SV Floor (%)	5.0	6.0	7.0	8.0	9.0	10.0

Source: Fitch Ratings

Property Holding Costs

Two categories of property holding costs are material in Fitch's analysis.

1: Irrecoverable Operating Costs

Space that is physically vacant may impose costs (e.g. marketing) or accrue a share in general overheads (e.g. utility costs for common areas or property management costs) that cannot be recovered from tenants. This is in addition to operating costs borne by landlords on occupied space on the basis of, for example, local laws, lease type, applicable taxation, ground rents. Fitch makes an assumption on total irrecoverable costs in its analysis. For new and existing ratings, Fitch informs its assumption about ordinary irrecoverable costs by referring to historical or

estimated recurring operating costs. The assumption applied may differ from historical evidence after cross-checking against other market-wide data (e.g. from property market research or comparable transaction evidence).

The current minimum fall-back cost rates used for leases where reliable cost data are not reliable are listed in the table below. As economic vacancy is subject to cyclicality and feeds into the irrecoverable cost base (as no tenant is in place that can be recharged), cross-checking against comparables drawn from across the cycle can help Fitch derive a stabilised level of costs. This level may be considerably in excess of minimum fall-back assumptions where Fitch expects prevailing high vacancy to persist or in markets with widespread meaningful ground rents, such as Finland.

Irrecoverable Cost by Lease Type
(% of headline ERV)

Lease type	Definition	Minimum fall-back cost assumption
Triple net	The tenant is solely responsible for all of the costs relating to the asset	0
Double net	The landlord bears the majority of the costs, while the tenant is required to pay property taxes and premiums for insuring the building	8
Single net/gross	The landlord bears the majority or all of the costs	15

Source: Fitch Ratings

2: Capital Costs

Building depreciation suggests an economic cost to landlords, implied in rental yields demanded by investors. However, given a typical time lag of five to 10 years between the date the ERV is initially quoted and loan maturity, in Fitch's rating analysis depreciation costs are deducted from lease income. The guidance for this cost, as a percentage of ERV (net of SV), can be seen in the table below (although longer loan terms may warrant greater depreciation).

Capital Cost by Property Type
(% of ERV)

Lease type	Guidance assumption
Office	7.5
Retail	4.1
Retail warehouse	20.0
Shopping centre	10.0
Industrial	2.8

Source: Fitch Ratings

However, assumed depreciation costs may be reduced where: (i) periodic capital expenditure is covenanted in the loan documentation or is otherwise expected (e.g. for sponsors holding substantial equity in relation to the collateral's residual value); (ii) high-quality tenants are required to make dilapidation payments at lease expiry (no higher than a 3pp reduction to the guidance depreciation assumption); (iii) collateral liquidation is expected to occur materially earlier than in typical CMBS loans; (iv) the property has demonstrable "green" credentials (including superior operating carbon performance) indicative of materially reduced climate transition policy risk (notwithstanding potential cost implications of relevant systems, appliances or construction) or (v) the property has been revalued during the loan term, where Fitch considers that the appraiser's estimate of ERV already accounts for depreciation. In certain instances, Fitch will set higher depreciation if the costs associated with the condition of the building (including potential or actual retrofitting costs associated with bringing the building in line with higher environmental sustainability standards) are not elsewhere reflected in the analysis (e.g. in SV).

Fitch is sometimes presented with business plans that outline projects to reinstate or enhance the quality/value of the collateral. Capex plans range from standard maintenance expenses to value-add upgrades (e.g. property expansion, speculative refurbishment); they are funded by equity and/or debt, the latter typically ranking pari passu with the senior financing, and added to the allocated loan amount of the subject property.

When analysing a financing comprising a capex debt, Fitch will assess the structure of such financing. Along with the magnitude of the likely effect of the capex on future quality/value in relation to a potential debt drawdown, we consider whether capex debt drawdowns are compartmentalised by project, limited by a specific budget and milestones and conditional upon upfront equity down-payment. If these controls are considered appropriate, or where there are equivalent documented funding controls (e.g. where spends are subject to agent consent), Fitch 1) gives credit to such capex being invested in the collateral by modelling the quoted ERV (in case this already assumes backlog/maintenance spent) plus an ERV uplift determined by the capex debt proportion earmarked for improvement multiplied by the portfolio 'Bsf' weighted average (WA) cap rate; and 2) models the full debt amount including the capex line. Junior-ranking capex debt has therefore a neutral effect in the analysis.

If instead capex debt drawdowns are subject to loose limitations, e.g. where the borrower has greater discretion in how to spend funds drawn under the capex facility, faces a low hurdle in terms of prior contribution towards costs, and/or where the debt availability is disproportionately great in relation to the project – or if the capex drawdown ranks senior to the term loan – Fitch will include the additional leverage in its modelling.

Sundry Cash Flow

In aggregating unit-level cash flows together for each loan in its rating cases, consideration is given to sundry cash flows. These are income elements not linked to lease payments but rather to short term/opportunistic factors; they are therefore typically more volatile than rental income. Examples include turnover elements of rent (any variable component related to the operating performance of the tenant), and advertisement space fees. Sundry income can also be negative in cases where remediation payments or other payments from the borrower to third parties need to be made.

Subject to Fitch's assessment of its volatility, credit to positive sundry cash flows is scaled by the severity of rating case. The cash flow impact is in Fitch's projection of the loan level payments but (unless considered a structural feature of the market, as in the following paragraph) sundry income does not affect the collateral value due to underlying uncertainty. The contrary cash flow effect of negative sundry cash flows is assumed in full in all rating cases for the purposes of loan level payment projection, but again does not affect projected value unless it is considered permanent.

Uncertainty about economic performance has pushed property types that have traditionally been used by landlords as a means to passive returns towards profit-sharing propositions with active management required to sustain meaningful rental income. In such cases, valuers may refrain from quoting static ERVs, but rather calibrate, at least partly, market rent using an estimate of future sales. When the turnover element of rent is very high, Fitch may allow this into its calculation of projected value, albeit with higher stress severity to recognise its volatile nature.

Stylised Illustration of Rental Decline
Example of market with above trend market rent
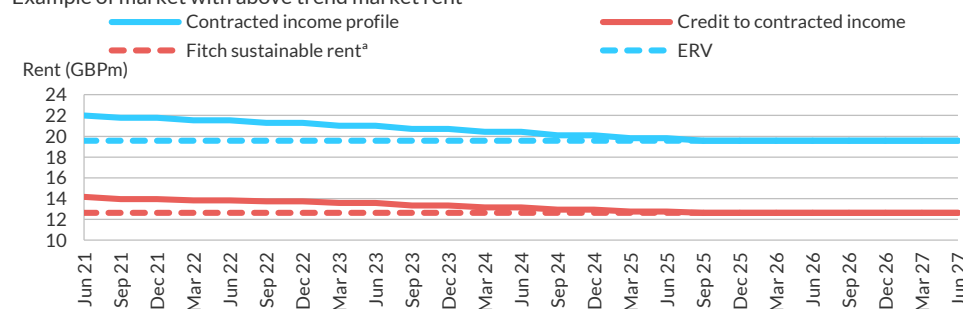
ª Fitch sustainable rent = ERV net of SV, RVD and capital costs
Source: Fitch Ratings

Refinancing Analysis

In its rating analysis, Fitch assumes that income permanently adjusts (in the vast majority of cases down) to a stressed market level, taking into account Fitch's assessment of the combined effects of tenant default, vacancy risk, market cycles, depreciation and costs. For CMBS that are not credit-linked and fully amortising, the income analysis is only one half of the full collateral analysis. The other half, which is described in this section, deals with how income is converted into an estimate of stressed CRE value, which is a key driver of refinancing (balloon) risk and overall credit quality. The main assumption used for this purpose is the capitalisation rate (cap rate), being the average rental yield investors will seek to earn over the projection period. Other assumptions relate to transaction costs upon disposal.

Capitalisation Rates

The value of CRE income is determined in relation to rental yields demanded by prospective investors. As with any other asset valuation, yield reflects the perceived risk of an asset relative to other opportunities. More stable sources of income will typically be valued at lower yields than less reliable income sources. A record of predictable performance encourages disparate investor projections of income and value to converge, further reducing the liquidity premium embedded in yields.

For low and stable interest rate scenarios, Fitch's cap rate and RVD guidance assumptions are derived jointly, as described in Appendix 2.

For high interest rate scenarios, Fitch maintains the low or stable interest rate scenarios 'Bsf' cap rate and applies country-specific multipliers to the post-2000 market-specific yield peak to arrive at the 'AAAsf' guidance cap rate assumption, using equal ratio interpolation between 'AAAsf' and 'Bsf' to determine the values for intermediate rating cases.

The 'AAAsf' multipliers are derived by comparing peak yields in the period 1990-2000 for markets (in the relevant country) with data available throughout that period compared to the post-2000 peak yields for the same subset of markets. This approach is designed to inform our high interest rate scenarios with information from a period with episodes of high interest rates (1990-2000), and avoids discriminating arbitrarily for data length while preserving a critical mass of observations for most countries. We apply the 'AAAsf' multipliers (floored at 1.1x the post-2000 peak yield) at the country level to reflect national differences in political, social and economic factors.

Valuation Approach

Property appraisers estimating current value may separate out contracted income from less certain future sources and apply differing capitalisation methods to reflect the disparity in visibility.

Fitch applies a single capitalisation method, with average net property income over the projection period divided by the appropriate cap rate. This simpler approach reflects that Fitch's results are generally driven by terminal value (depreciated stressed rental value, net of structural vacancy, divided by the rating case cap rate). This is because a loan defaulting at maturity will typically have relatively little high-quality contracted income remaining, whereas a loan defaulting during its term will typically have suffered a loss of contracted income: in either case, in Fitch's analysis it does not tend to take long for average net property income to stabilise at the stressed level.

Adjustments for Leasehold Interests (or Equivalent)

For properties subject to leasehold ownership, Fitch will assess the relationship between the remaining leasehold tenure and asset value. In jurisdictions, such as the UK, where there is a risk of leasehold forfeiture and/or the leasehold renewal process is convoluted, income is only projected for the duration of the leasehold (unless adequate support is provided that addresses the likelihood and cost of a leasehold extension). In particular, once a UK leasehold term falls below 60 years, there is an accelerated diminution of the remaining asset value compared to freehold assets. These properties are scored down to account for this weakness: leaseholds below 15 years will be assigned a property score of '7' (see the Structural Vacancy section for details), leaseholds of 15-29 years score no better than '6', those of 30-44 years no better than '5', and 45-60 years no better than '4'.

Where the leasehold renews automatically after the current term and the costs for the renewal are known or governed by a framework of law or convention, the use of a replacement score can be substituted by deducting the predicted renewal costs/future ground rent from the property value/cash flows.

For leasehold properties of any type, Fitch will consider whether the relative magnitude of ground rent is sufficient to justify higher cap rates on projected leasehold income. This consideration is relevant for leasehold collateral encumbered by materially higher ground rents than the CRE population on which yield data supporting our cap rate assumptions are based, and is especially acute for leasehold property with upwards-only ground rents, with the prospect of ground rents rising within the capitalisation horizon of the analysis - prior to 20 years from the end of the enforcement period.

At the other end of the spectrum, for ground rents that are not upwards-only and can plausibly be expected to move in line with property income over the long term, no increase in rating cap rates may be justified. Some leasehold properties may fall within this range (e.g. ground rent manageable in relation to property income, with upwards-only reset date falling after the capitalisation horizon).

Property Transaction Costs

Transaction costs are applied whenever Fitch calculates a property value. The seller of a property typically pays real estate agent fees and legal fees, while the purchaser bears the registration fees, real estate transfer taxes and additional agent fees. Fitch reflects all of these in its valuation, as a percentage haircut on the asset value. In determining the appropriate assumptions, Fitch ensures they are consistent across different countries and that the net asset value reflects that which a willing buyer is prepared to pay, net of any costs.

Transaction cost assumptions are specified with reference to common practice in the relevant property market. In rating cases where the loan fails to repay at maturity, an additional foreclosure cost assumption will be applied. See Appendix 7 for the guidance assumptions.

Property Liquidation

CMBS loans must be worked out (or if permitted, sold) by a specific date (the bond legal maturity) to avoid note default. This limits the flexibility available to servicers, and unless a bond extension is achieved, may force a quick sale of the asset in a weak market.

Unless the approach described under CRE Loan Ratings suggests a higher rating or there is sufficient cash flow to repay the note by its maturity, Fitch will not rate tranches above the 'Asf' category if the tail period defined by transaction documents is below 24 months, 'BBBsf' if below 18 months, or 'BBsf' if below six months. The rating will also be constrained if forward-looking projections of bond amortisation show that a tranche could be exposed to the recovery prospects from a limited number of non-prime properties. In most cases, Fitch would expect to see a tail period of at least five years to achieve high investment-grade ratings. See Appendix 4 for more information.

Early in the life of a CMBS, the tail period is available in full in case of loan default (at loan maturity). Should a loan have defaulted at its maturity, any time taken in resolving the loan erodes the time left until bond maturity. If loan workout takes longer than expected initially, the driver of Fitch's ratings may be constrained below what is implied solely by leverage, depending on Fitch's assessment of broader operational risks such including property portfolio composition and the stage in the legal process.

As a transaction approaches legal final maturity, collateral quality becomes less of a defence against the growing execution risk associated with a speedy disposal. In such cases, recovery value may be traded off against timeliness to avoid issuer default (and related uncertainty) at legal final maturity. This trade-off acts as a constraint on the maximum achievable rating when the remaining tail period falls below certain thresholds: ratings are capped at 'Asf' within the final 24 months, 'BBBsf' within the final 18 months and 'BBsf' within the final six months. Fitch expects that new transactions will continue to address these concerns by incorporating longer tails, typically at least five years.

When Is the Asset Analysis Different?

The methodology explained so far holds for the majority of loans reviewed by Fitch. However, there are collateral types that, where they represent a significant exposure for noteholders, require a slightly different approach for various reasons.

Operating assets are characterised as those with short-term revenue and variable cost structures. In one subcategory of operating assets are properties with a maximum capacity measurable in terms of occupancy, such as hotels. In Fitch's analysis, non-tenanted hotel's highest free cash flow (FCF) is not necessarily achieved by maximising occupancy, but depends on the sensitivity of linked revenue and cost items to occupancy, as well as the market power to price-discriminate/price-set afforded to the operator by the hotel's characteristics. To assess the resilience of FCF, Fitch runs an income statement analysis of the specific hotel operations (see below).

In the same subcategory are ticketed venues, such as events arenas and cinemas, which share some characteristics with hotels. A hotel-style profit-and-loss analysis may apply should corresponding historic market data covering per unit income and costs be made available for such assets, along with recent financial statements that allow relevant sensitivity coefficients to be specified.

For two other capacity-constrained asset types, PMRP and purpose-built student accommodation (PBSA), competition deprives most operators of lasting market power to price-discriminate, making them price-takers in the course of maximising occupancy. This is reflected in the tailored approaches described below.

For operating assets that are not measurable by occupancy (e.g. pubs), Fitch can analyse them using these criteria provided ERV together with historic market rental and rental yield data are made available, in which case a traditional CMBS analysis applies.

In cases where creditor exposure to alternative assets like pubs, hotels or car parks is low enough, the collateral may be mapped to traditional sectors based on their next-best use type, as informed by the valuer and/or the location, subject to the assets in question and the information provided in the valuation reports.

Hotel Assets

This section details Fitch's methodology for analysing EMEA hotel collateral. It is designed to be applied when rating new issue CMBS and for the surveillance of legacy transactions exposed to hotel collateral.

These criteria are designed for hotels in EMEA with a performance track record allowing Fitch to determine appropriate "day one" performance metrics and that operate in markets with a track record of occupational demand and investment supported by historical market data.

As with other CRE, the key determinant of hotel loan default probability and loss severity – as creditors have recourse solely to the charged assets – is collateral performance. Fitch will estimate hotel values corresponding to projected asset net income as well as investor demand. FCF and the cap rate are therefore the two main drivers of hotel real estate risk in Fitch's rating analysis. Fitch uses its EMEA CMBS Hotel Model to stress FCF by applying both supply- and demand-side stresses to individual properties, the results of which are input to the EMEA CMBS Asset Model where cap rates are applied to derive loan level recoveries.

Given the short-term, granular nature of hotel income, Fitch's assumed reductions to FCF are staggered in a linear fashion over a period consistent with observations in the relevant market. In-place FCF will ramp down to Fitch's supply-adjusted level over a period consistent with how long the relevant submarket has taken to pass from peak to trough, using previous cycles as a basis. This is most relevant for loans exposed to short-term FCF, for instance, those where principal repayment is due in the near term.

In the UK and Spain, a period of 36 months is assumed as guidance for in-place FCF reduction, in line with past cycles in RevPAR data. Staggering the FCF stress accordingly means that for loans with amortisation scheduled or full repayment due within three years of the analysis, greater credit is given (as constrained by stressed FCF net of interest costs).

This analytical framework applies for hotels whose operations are sufficiently transparent to Fitch. Typically, these hotels will be subject to management contracts, franchise agreements or otherwise owner operated. Tenanted hotels subject to lease contracts are not covered in this section.

Glossary of Terms for Hotel Section

The following hotel and methodological terminology is used in this report.

- ADR (average daily rate): the average price achieved per room night sold. It is calculated by dividing the total room revenue by the number of room nights sold.

- Occupancy: the percentage of rooms sold over a period. It is calculated by dividing the number of room nights sold by the number of rooms available for sale over the same period.

- RevPAR (revenue per available room): The product of ADR and occupancy. It is calculated by dividing total room revenue by the number of rooms available during the given period.

- F&B: food and beverage.

- TRevPAR (total revenue per available room): calculated by dividing total revenue by the number of rooms available during the given period.

- RevPARD (RevPAR decline): Fitch-stressed RevPAR based on observed historical market volatility.

- GOP (gross operating profit): total hotel revenue net of operating costs but gross of capital expenditures and management fees.

- GOP margin: GOP as a proportion of revenues.

- In-place GOP margin: the GOP margin for the subject property as reported in financial statements for the relevant input year.

- In-place FCF: free cash flow of the property, as reported in the cash flow statement.

- Market GOP margin: average GOP margin reported by Hotstats for the relevant input year for the market in which a property operates.

- Herfindahl Index (HI): calculated as the sum of the squared in-place FCF shares of each hotel relative to total in-place portfolio FCF financed by a given loan. For fully sequential multi-borrower transactions, a lower measure of concentration may be applied for any loan to reflect a larger aggregate portfolio, particularly for more senior notes. The index is a continuous variable between 0 and 1, with a reading of 1 indicating no granularity (single property) and a reading converging to 0 indicating progressively higher granularity.

- Neutral HI reading: 20%, referred to as a "neutral portfolio". Fitch considers a portfolio HI of 20% to be a "neutral" reading in terms of granularity. This would be represented by a portfolio of five properties, each with equal in-place FCF. As FCF becomes more unevenly distributed among properties, a larger number of assets are required to achieve neutrality.

- Strong HI reading: 2.5%. This would be represented by a portfolio of 40 properties, each with equal in-place FCF.

- Benchmark GOP margin: for a neutral portfolio, a hotel's benchmark GOP margin equals the lower of the in-place GOP margin and the market GOP margin. Positive/negative adjustments are made to this benchmark for more/less granular hotel portfolios. At the lower granularity limit, for single hotels (HI reading of 1), the benchmark GOP margin is the lower of the in-place GOP margin and 90% of the market GOP margin. At the upper granularity limit (the strong HI reading defined above), a hotel's benchmark GOP margin is equal to the in-place GOP margin. This benchmark applies directly to hotels with a supply grade of "c", and serves as the basis from which linear adjustments are made to

the GOP margins applied to hotels with other supply grades; see *Herfindahl Index and Supply Adjustment* below for an illustration of how these adjustments operate.

- GOP premium: the difference between the subject property's in-place GOP margin and the benchmark GOP margin (if positive, otherwise 0).

- Supply-adjusted GOP: the level of GOP Fitch assumes after making all supply-side adjustments to in-place GOP.

- FF&E (fixtures, fittings and equipment): periodic capital expenditures on these items.

- FCF (free cash flow): The owner's periodic operating return after all costs and fees are accounted for. This is the income available to service debt.

Supply Adjustment

Fitch may lower in-place revenue to account for potential increases in the stock of rooms in the relevant market resulting from competition for profits. The agency performs a peer review of GOP margins across comparable hotels in the market. This risk is high where a generic hotel is trading materially above the relevant market benchmark.

In the first stage of the analysis, Fitch grades each property's resilience to a potential increase in the supply of competing beds. This involves assessing attributes of the hotel and its market, as below.

Illustration of Supply Adjusted GOP Margin (%) by Herfindahl Index and Grade

HI >>>	50%			32%			17%			6%		
Grade	Adj. GOP margin	Bsf FCF	AAAsf FCF	Adj. GOP margin	Bsf FCF	AAAsf FCF	Adj. GOP margin	Bsf FCF	AAAsf FCF	Adj. GOP margin	Bsf FCF	AAAsf FCF
a	38	22	12.1	38	22	12.1	38	22	12.1	38	22	12.1
b	34.4	20.3	10.3	34.75	20.3	10.5	35.5	20.6	10.9	37.4	21.7	11.8
c	30.8	18.5	9.2	31.5	18.5	9.5	33	19.1	10.1	36.8	21.3	11.6
d	8	4.6	2.2	8	4.6	2.2	8	4.6	2.2	8	4.6	2.2

Source: Fitch Ratings

Fitch Hotel Supply Grades

Supply grading	Description	Reduction to in-place GOP margin	Example attributes
a (Exceptionally resilient)	Dominant hotel in mature market with high barriers to entry	Zero	Protected status (e.g. on-site airport concession); high-value features (e.g. elite conference centre); landmark in cultural heart of city
b (Reasonably secure)	Well-invested hotel and market; moderate barriers to entry	50% GOP premium	Proven track record; flexible operations; proximity to visitor/business hubs
c (Reasonably vulnerable)	Underinvestment in hotel/immature market; low barriers to entry	100% GOP premium	Generic, outmoded or inflexible offering
d (Marginal or uncompetitive)	At risk of becoming unviable without facing an adverse shock	To maximum of 25% of market GOP margin	Historical underinvestment; revenue rundown; unstable market

Source: Fitch Ratings

Once assessed, any hotels for which less than 36 months' operating data are available lose one grade from the original supply grade assigned. If less than 18 months is covered, the supply grade will incur a two-grade penalty. No credit will be given to income or value from non-tenanted hotels that present less than one full year of operating history. Suggested operating

data lengths stated here should be used as a guide; Fitch would also consider giving no credit to operations on a hotel-by-hotel basis.

To account for supply-side risks Fitch may look to reduce a hotel's in-place GOP margin based on its grade. Any consequent haircut to in-place revenue is quantified in relation to the GOP premium, which measures the hotel's operating performance against the relevant market benchmark.

The first step is to review the operating cash flow statement for each hotel. Fitch identifies the in-place GOP margin from the hotel's operating data after adjusting for exceptional sources or diminutions of revenue or cost (for example, the Olympic Games could inflate local room rates, or a comprehensive refurbishment could inflate costs while reducing occupancy-related income). The in-place GOP margin may be further modified to reflect local market P&L conventions, e.g. pre or post management fees.

The next step is to identify the contemporaneous market GOP margin from third-party market data provided to Fitch (in the UK, this is from Hotstats; in Spain, we use Christie & Co). Where hotels are trading more favourably than the market average, this may reflect, among other things, temporary supply-side conditions, such as generous supplier terms or customer contracts, an unusually high degree of management focus, brand-related benefits, or a prolonged lead time before more hotel rooms can be supplied. As it identifies outperformance with a risk that temporary support may weaken (for example, should the supply of competing rooms rise), Fitch may apply a haircut to in-place revenue.

Fitch recognises that individual hotel operations are subject to idiosyncratic, local factors. As loan collateral pools become more granular, therefore, there is lower risk of adverse supply-side pressure on portfolio-wide GOP margins, and Fitch tempers any haircuts that may apply. Conversely, there is a need to address the emerging tail risks of concentrated portfolios (HI reading of more than 20%). As a result, the haircuts to in-place revenue for properties in such portfolios ensure that GOP margins for hotels graded "c" are below market averages (as concentration increases there is a greater chance this will also apply to hotels graded "b").

Fitch measures portfolio granularity for each loan using the Herfindahl Index. Fitch derives benchmark GOP margins for each constituent hotel based on its in-place GOP margin, the market GOP margin and the HI reading. Any excess in the hotel's in-place GOP margin over the benchmark GOP margin is the GOP premium.

For neutral portfolios, represented by five hotels with equal in-place FCF, the benchmark GOP margin for an individual hotel equals the lower of its in-place GOP margin and the market GOP margin. The GOP premium (if any) of a hotel graded "c" in this portfolio would fall to zero (i.e. it is capped at the market average); the GOP premium of one graded "b" would be halved.

For more granular portfolios, the haircut to in-place revenue is lower. The benchmark GOP margin for a hotel graded "c" is set between the market GOP margin and the hotel's in-place GOP margin (if higher), based on linear interpolation (in proportion to where the HI reading falls between neutral 20% and 2.5%). If lower than the market GOP margin, its in-place GOP margin will be the hotel's benchmark GOP margin.

In portfolios that are more concentrated than a neutral portfolio, the benchmark GOP margin for a hotel graded "c" is capped between 90% and 100% of the market GOP margin, depending on where the HI reading falls between 20% (neutral) and 100% (using linear interpolation).
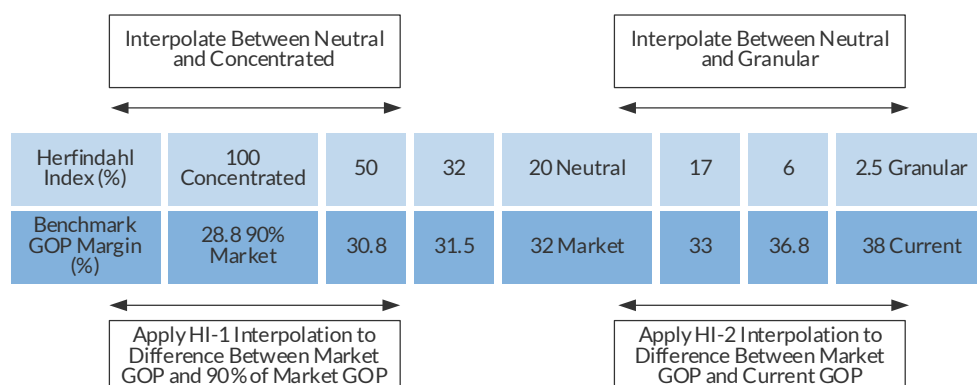
In either case, hotels graded "b" will get a benchmark GOP margin halfway between this and their in-place GOP margin.

Hotel Illustration

In-place GOP margin (%)	38
Market GOP margin (%)	32
In-place revenue (GBP)	100
In-place FCF (GBP)	22

Source: Fitch Ratings

Herfindahl Index and Supply Adjustment

	Interpolate Between Neutral and Concentrated			Interpolate Between Neutral and Granular			
Herfindahl Index (%)	100 Concentrated	50	32	20 Neutral	17	6	2.5 Granular
Benchmark GOP Margin (%)	28.8 90% Market	30.8	31.5	32 Market	33	36.8	38 Current
	Apply HI-1 Interpolation to Difference Between Market GOP and 90% of Market GOP			Apply HI-2 Interpolation to Difference Between Market GOP and Current GOP			

Source: Fitch Ratings

The assumed haircut to the in-place GOP to reflect a withdrawal of favourable competitive conditions is greater for weaker hotel supply grades. Apart from hotels graded "a" (exceptionally resilient) or "d" (already marginal or unviable), the haircut grows with portfolio concentration. In addition, to ensure tail risk arising with especially concentrated portfolios is captured, Fitch gives no credit above 'Asf' to hotels graded below "b" for loans with HI greater than 35%.

This approach differentiates not only by hotel quality and portfolio granularity, but also for the condition of the wider market against which the hotel is judged: where average GOP margins are high, perhaps bolstered by tight planning or high land values (e.g. London), supply adjusted GOP margins will also tend to be higher in Fitch's analysis (all else staying the same).

Any downward adjustment to GOP is brought about by reducing in-place revenue (TRevPAR) by uniformly haircutting the various in-place sources of nominal income. For room-related income, this implies a reduction to in-place ADR rather than occupancy. With these adjustments, Fitch derives adjusted in-place total revenue.

The following worked example refers to the figures in *Herfindahl Index and Supply Adjustment* above. The hotel has a GOP margin of 38%, higher than the 32% market average. However, because its resilience to competition is only scored as "c" and it is financed in a portfolio with a HI of 32%, its supply adjusted GOP margin is 31.5% (i.e. 98.5% of the market average) for investment-grade rating cases.

This adjustment is brought about by assuming TRevPAR falls uniformly (via price reductions) with no reduction to costs.

Effect of Supply Adjustment

	Raw input	Adjusted input (at IG)
Revenue		
Rooms	3,550,000	3,212,233[a]
Food & beverage (F&B)	1,500,000	1,357,282
Telephone	0	0
Rents (retails/others)	0	0
Others income	100,000	90,485
Total revenue	5,150,000	4,660,000
Expenses		
Departmental expenses	2,400,000	2,400,000
Operating expenses	793,000	793,000
Total	3,193,000	3,193,000[b]
GOP (%)	38.0	31.5[c]

[a] Revenues are haircut, [b] Expenses remain the same, [c] GOP adjusts downward accordingly
Source: Fitch Ratings

Demand Shock

A key rating driver for debt secured on hotels is the potential impact on RevPAR, and therefore on collateral value, of future demand shocks, whether due to pressure on disposable incomes or changes in consumer behaviour. In establishing this impact by running rating case stresses, base case RevPAR is haircut by a factor (RevPARD) to recognise the effect on room revenue of a downturn in occupational demand. The adjustment is similar to RVDs applied in typical CRE, albeit with certain differences; whereas RVDs are applied in Fitch's typical CRE analysis as a reduction in price, RevPARD is applied to hotels as a reduction in room revenue – via price (ADR) and/or quantity (occupancy) – a difference described below.

RevPARD guidance assumptions are determined in line with RVDs (as applied to typical CRE). First, Fitch corrects seasonal factors in the monthly market RevPAR data by calculating a 12-month rolling average, collated quarterly, from the monthly data. This modified time series market data is then analysed according to the wider RVD-derivation approach described above in the section titled Rental Value Decline, which generates RevPARD guidance assumptions for each market.

In the UK, Fitch pairs 1) RevPAR data for Greater London/rest of the country (both further split into upscale and midscale quality tiers) with 2) vacant possession prime yield data for hotels from four categories (central London/Greater London/primary cities/secondary cities), creating eight market segments each with their own guidance assumptions for RevPARDs and cap rates.

For those regions outside Greater London for which Fitch maintains RevPARD assumptions, the numeric intervals between RevPARDs at different rating categories are equal, derived by analysing aggregate RevPAR data for the UK (ex-London). These intervals are added to 'Bsf' RevPARDs for each region, derived directly from the regional RevPAR data. This approach strikes a balance between viewing regional UK hotels as substitutes for one another; and recognising variations in regional RevPAR performance over time.

In Spain, we recognise four market segments: prime urban, secondary urban, prime resorts and secondary resorts for both RevPARDs and cap rates.

The RevPARD applicable to a given hotel in a given rating case always leads to a proportionate reduction in room revenue in Fitch's cash flow analysis. RevPARD is also a useful correlate for stresses on non-room revenue – mainly food & beverage and event income – in a downturn. Fitch finds from data available for UK hotels and in discussions with experts on the Spanish market that these sources of income are less sensitive to stress than room revenue, varying only 50%-80% as much as RevPAR. This may reflect that operators are more inclined to discount rooms than other inventory in order to attract guests and support overall business. Where it finds evidence, Fitch may reduce the stress applied to non-room revenue as compared to RevPARD (in the UK, for example, Fitch applies 0.8x RevPARD as guidance when stressing non-room revenue).

In managing a downturn in demand, hotel management may prefer to sell fewer rooms at higher prices in certain circumstances. Although the effect on RevPAR is the same (as it is the product of occupancy and ADR), running with lower occupancy typically allows certain unit costs to fall. Fitch assumes that, subject to competitive limits, management will exhaust its pricing power (by sacrificing occupancy) before it considers reducing ADR. Instances where these competitive limits are assumed to apply, which is a function of the hotel's pricing power as judged by Fitch, are described below under *Pricing Power*.

Costs

Fitch assumes that some of the daily costs incurred in making rooms and refreshments available and in hosting events are essentially fixed, for example payroll on core staff and on contracted services such as security or equipment hire. A cut in these expenditures would imply that management trades down hotel quality, in Fitch's view. Applying a fixed component to relevant "departmental" costs – identifying a nominal fixed amount per expense item for a given hotel – requires an assumption about what proportion of running costs is unavoidable "per available room". Fitch generally assumes 30%-40% of room costs are fixed, 50%-70% for F&B and 50%-70% for events.

Within these departmental ranges Fitch will form a view on fixed costs per hotel based on property site visits, conversations with hotel management and the scale of the hotel's offering. Fitch will sense-check its assumptions for fixed-cost ratios by comparing them with the actual

experience of each hotel, as denoted by its operating data. Fitch will also consider attributes evident from valuation reports and from wider research. If there are relevant nuances, such as a meaningful proportion of revenue from venue hire or gym fees, for example, with related information on associated fixed costs, Fitch may apply assumptions outside these ranges.

In each case, this cost ratio is applied to an estimate of the hotel's typical costs, based on average historical occupancy rates in the relevant market. Therefore, if the hotel trades at above-average occupancy, a lower fixed proportion will apply to its actual costs, and vice versa. The balance of costs is not fixed but varies with occupancy in Fitch's analysis: by sacrificing occupancy to defend ADR, hotel management is assumed to be able to reduce variable departmental costs (for example, temporary staff, room utilities, maintenance and some raw materials). Where, having exhausted pricing power, ADR starts falling under the effect of the demand shock, no further reduction in variable costs is assumed.

Pricing Power

Fitch's assessment of pricing power involves a secondary assessment of hotel quality. While there may be some overlap with the supply grades described above, and the assessment is informed by the same information sourced from on-site inspection, valuation reports, wider research and Fitch's experience of comparable properties, the demand grades may differ.

This pricing power assessment aims to grade how much flexibility in dealing with a downturn the specific attributes of a hotel give its management (whoever acts in this capacity). A grade of "A" applies where the level of occupational demand for the hotel is exceptionally well rooted, giving management quasi-monopoly pricing power; this may reflect that its features can be recreated or approximated in the market only at significant expense. In addition to having some of the same features associated with supply grade "a", hotels graded "A" for pricing power will gain business from a diverse array of customers drawn to its location near a variety of attractions.

Hotels are graded down as they are judged to be progressively less well located, with more transient or concentrated sources of business, less well equipped and more commodity-like. A score of "D" implies that even in a mildly stressed environment – as reflected by a 'Bsf' rating case – the property is forced to accept lower ADRs as a demand stress builds up. Properties scored at "C" can react to demand shocks by reducing occupancy up to and including 'BBsf' rating cases, whereas those scored "B" can do so up to and including 'Asf' rating case levels. Only hotels scored "A" can maintain ADRs – and trade-in occupancy – in 'AAsf' and 'AAAsf' ratin cases.

Fitch considers that management is always ultimately motivated to maximise FCF. However, Fitch assumes the degree of control that management exercises in setting pricing is constrained by the market (unlike occupancy, which management can in theory boost simply by giving away rooms for free, naturally at significant cost). Constraints on defending ADR exist because the relationship between price and occupancy is not linear, i.e. above a certain ADR no guests are likely to visit any hotel.

Fitch Hotel Demand Grades

Grade	Pricing power
A	Flexibility to reduce occupancy in favour of ADR in all rating cases
B	Flexibility to reduce occupancy in favour of ADR up to 'Asf' cases
C	Flexibility to reduce occupancy in favour of ADR up to 'BBsf' cases
D	No flexibility to reduce occupancy in favour of ADR

Source: Fitch Ratings

This constraint is meaningful in the rating analysis because in most cases Fitch would expect defending ADR over occupancy to support FCF, due to the level of occupancy-variable costs. This occupancy constraint is assumed to be tighter for low-grade hotels with little pricing power, and applies to all hotels at an absolute floor of 50%. Hotels graded "A" are assumed to face no higher floor to occupancy, which can instead fall by the degree required to absorb the RevPARD in full (provided occupancy remains above 50%). The same applies to grade "B" hotels, but only in rating cases up to and including 'Asf', and to grade "C" hotels, but only up to and including

'BBsf'. Whenever the occupancy floor applies, the residual RevPARD is assumed to be absorbed as a reduction in ADR.

In this way the flexibility available to managers to mitigate the adverse effect on FCF of downturns in demand is assumed to be reduced for hotels that either can be easily substituted because of standardisation in offer (e.g. mid-range hotels clustered around city transport hubs) or those that occupy a market niche where occupational demand is precarious (e.g. a hotel serving a remote golf course). The result will be to progressively limit the capacity of managers of weaker hotels to defend ADR and manage room costs down in a downturn, leading to higher market value declines in the more severe rating cases.

Interest Rate Stresses

Broadly in line with its wider structured finance criteria, Fitch runs increasing, stable and decreasing interest rate stresses to test for interest rate risk. For hotels earning a significant proportion of revenues from overseas guests (whose own income is earned in a foreign currency), the risk of a sustained reduction in nominal revenue coinciding with tight domestic monetary conditions is higher than in typical CRE (whose population of tenants operates domestically). Therefore, Fitch will apply some or all of its RevPARD assumptions alongside its high interest rate scenario for such hotels.

Hotel Rating Caps

In Fitch's view, high investment-grade ratings are not compatible with substantial exposures to properties with either supply or demand-side weaknesses. As a result, in portfolios with HI greater than 35%, only properties scored at least "B"/"b" contribute to recoveries in 'AAAsf' and 'AAsf' rating cases.

Example 1

Number of loans: 1

Number of properties: 1

Herfindahl Index: 100%

Property score: "a"/"C"

Concentrated Portfolio – Effect of HI and Rating Cap

	In-place	Supply-adj.	B	BB	BBB	A	AA	AAA
FCF	1,500	1,500	1,236	1,155	1,074	993	CAP	CAP
Value	21,429	21,429	17,507	15,483	13,629	11,921	CAP	CAP

Source: Fitch Ratings

Example 2

Number of loans: 1

Number of properties: 3

Herfindahl Index: 28%

Property score: "a"/"A", "b"/"B", "c"/"C"

More Granular Portfolio – No Rating Cap

	In-place	Supply-adj.	B	BB	BBB	A	AA	AAA
FCF	4,800	4,230	3,455	3,212	3,006	2,725	1,887	1,703
Value	68,571	60,419	48,937	43,050	46,265	32,711	21,446	18,310

Source: Fitch Ratings

Professionally Managed Residential Portfolios (PMRP)

In European housing, with some exceptions (e.g. Germany and Switzerland) the private rental sector (PRS) is dwarfed by the owner-occupied sector and supplied largely by non-institutional landlords. German multifamily housing supply is dominated by institutional landlords, which were historically long-term players. Investor interest in these assets in the past 15 years (financed to a significant extent via EMEA CMBS) meant direct evidence of rental yields has been compiled, albeit based on few transactions.

Demographic transition elsewhere in Europe is prompting emergence of a professionally managed residential (PMR) rental sector. PMR portfolios are characterised by high lease granularity and therefore strong income stability. While landlord income is secured on short lease terms, rather than limiting income visibility it tends to keep rents close to market levels, boosting predictability.

While transactional evidence of PMRP rental yields is scarce, rental data over decades is readily available given the volumes of short-term leases in all major markets. The OECD maintains useful housing data from many countries, including national rental indices, which suggest rents rarely lag inflation over the medium term. In the short term, rental volatility is below that reported for traditional commercial property. These attributes suggest PMRP rental yields will be strongly influenced by relevant real interest rates.

Housing supply has often lagged demand, putting upward pressure on real rents: where this has elicited a strong rental regulatory response (as in much of continental Europe), real rents have consequently been reasonably stable over decades. German multifamily housing reinstatement costs are typically well in excess of valuations, offering little stimulus to supply new units. Where PRS is lightly regulated, such as in the UK, real rents have risen faster than in Germany, but even this has not stimulated sufficient new supply, thanks largely to concomitant growth in residential land values.

Another hurdle facing developers of PMRP assets is the slow pace at which capital can be recycled (relative to developers of housing units for sale). Indeed, while oversupply was a strong driver of two of the more pronounced rental corrections in Europe – Spain and especially Ireland, after 2009 – oversupply was generated by undisciplined construction of new housing units intended for sale. The subsequent decline in house prices saw vacant residential units being rented out rather than sold at a loss.

Without concerted public-sector support for new rental housing development (key to the post-WWII reconstruction of western Europe that led to a surge in housing supply) or speculative private construction fuelled by a house price bubble, the evidence suggests supply of housing will struggle to keep pace with demand. This is likely to underpin nominal rents (in terms of national aggregates) right across developed Europe, which is attracting institutional investor interest in PMRP assets viewed as sources of stable long-term income.

Provision of long-term debt is essential if the PMRP sector can evolve from a nascent sector to a mainstream property type. Direct PMRP rental yield data are in limited supply. The OECD does maintain national price-to-rent indices, which combine data on house prices (including owner-occupied units) with rents. Lacking a single source, these indices are subject to systematic biases arising from differences in the composition and fiscal treatment of renting versus owner-occupying households. Still, "anchoring" a price-to-rent index with an independent direct estimate of rental yield at a given time will generate a rudimentary rental yield index, which provides "flanking" data for different countries.

In light of these particular circumstances – the nature of PMRP assets and direct data availability – Fitch has developed a customised methodology (data requirements are set out in Appendix 5). The starting point is to identify from historical cash flow data provided by the arranger gross income (from occupied residential units and other non-residential sources) and costs. Fitch's determination of stabilised gross income is assumed to be ERV (i.e. vacant units are assumed to remain unlet unless there is a credible explanation, such as recent refurbishment, in which case assumed ERV may exceed gross income). For longer-than-usual tenancies, Fitch may take quoted market rent into account when determining ERV.

Fitch considers several different cost categories; the main ones are listed below.

- Maintenance: expenses required on a regular basis to maintain the current condition of the rented portion of the property portfolio (e.g. minor repairs).

- Capital expenditure: additional expenses required to maintain the current condition of the entire portfolio, typically including costs that are not incurred annually (e.g. roofs, facades, and parking areas).

- Property management: all costs related to the management of the property portfolio, either by the borrower or a third-party manager.

Additional borrower costs may be assumed case by case. These may include modernisation expenses, deferred maintenance, environmental liabilities and pension expenses. Should detailed cost data (covering at least two years) not be available or be viewed by Fitch as inaccurately reflecting the long-term requirement (on an "arms-length" basis), assumptions for costs may vary from the most recent data, but will typically be floored in line with wider market observations and no lower than 25% of gross revenue (30% in Germany). Cost assumptions are applied as a capital cost (i.e. as depreciation of ERV).

Stressed income for PMRP assets varies by rating case as a result of corresponding variance in RVD and SV assumptions in line with traditional CRE, as described below.

Rental Value Declines

RVDs are applied to ERV consistent with traditional CRE types. RVDs are derived from OECD national rental indices (since 1990), floored at 5% (in all interest rate scenarios). The same RVD is used for all rating cases and all interest rate scenarios. For lower stresses, this simply reflects the far greater stability of PRS indices compared to other areas of CRE. More severe rating stresses for PMRP are characterised by high interest rates, and as with other CRE this is assumed to follow a period of rental inflation, negating additional RVD stress. RVDs for all rating cases are set at 5%.

Structural Vacancy

As with traditional CRE, a property's SV is a function of its score. PMRP property is scored on the basis of (i) the urbanisation of the town or city in which it is located, as proxied by its population (for the conurbation as a whole); and (ii) the concentration of the town or city in which the property is located within the housing portfolio securing that loan (with both numerator and denominator measured as number of units). For fully sequential multi-borrower transactions, a lower measure of geographic concentration may be applied for any housing loan to reflect a larger aggregate housing portfolio, particularly for more senior notes.

Guidance Property Score by Urbanisation and Concentration

Population	A <30%	B 30-50%	C >50%
A (>500k)	1	2 (1 if pop>2.5m)	4 (2 if pop>2.5m)
B (350k-500k)	2	3	5
C (250k-349k)	3	4	6
D (<250k)	4 (5 if pop<50k)	5 (6 if pop<50k)	6 (7 if pop<50k)

Source: Fitch Ratings

Whatever the allocation rules, we do not recalculate geographic concentration after conducting the loan prepayment analysis.

Where housing property disposals are subject to release pricing rules and housing contributes more than 50% of loan collateral ERV, we score down concentration by at least one grade.

A property's score corresponds to an SV assumption at each rating case (see tables below).

PMRP Structural Vacancy by Property Score and Rating Case (%)

	Bsf	BBsf	BBBsf	Asf	AAsf	AAAsf
1	2	2	4	6	8	10
2	2	2.5	5	7.5	10	12.5
3	2	3	6	9	12	15

PMRP Structural Vacancy by Property Score and Rating Case (%)

	Bsf	BBsf	BBBsf	Asf	AAsf	AAAsf
4	2	4	8	12	16	20
5	2	4.5	9	13.5	18	22.5
6	2	7.5	15	22.5	30	37.5
7	2	12.5	25	100	100	100

Source: Fitch Ratings

These SVs are on top of what vacancy is considered as stabilised for the portfolio as a whole, as informed by operating performance data and implied by ERV assumed by Fitch (as described above).

Cap Rates

After ERV is reduced for total costs, RVD and SV, the residual net operating income is assumed to be available for debt service and capitalised in deriving property value. As real residential income volatility is very low, and with little reliable rental yield data generally available for PMRP, Fitch refers to historical data covering 10-year government bond yields to determine rating cap rates. Fitch reviews bond yield data (also collated by the OECD) going back no earlier than 1990. (For Italy and Portugal, bond yield data is available from 1991 and 1993; these two data series have been backfilled using as a reference Spanish bond yields, retaining relevant premiums (versus Spanish yields) observed in the earliest data available for each of the two markets.

A separate "adjusted bond yield" time series is derived by Fitch, by deflating government bond yields by a prior rental growth ratio in the associated country; this ratio being equal to (i) the rental index in the same quarter divided by (ii) the rental index six years earlier. The adjusted bond yield therefore incorporates cumulative rental growth (if any) that occurred in the six years prior to a spike in government bond yields. Future rental growth will proportionately offset the reduction in future collateral value that would have been brought about had a stressed discount rate been applied to day one rental income. Rather than projecting rental growth explicitly and using discount rates drawn directly from elevated bond yields, Fitch uses the adjusted bond yield time series to calibrate cap rate assumptions.

A six-year lag is selected as a prudent measure of a representative duration from closing to refinancing/sale (i.e. for typical five- to seven-year floating rate loans). However, in case government bond yields are already elevated and/or could reach rates commensurate with rating cases more quickly (than rent could grow sufficient to justify reliance on adjusted bond yields), Fitch's country cap rate inputs are floored: (i) at 'Bsf', by 10-year government bond yields actually applicable at the time; and (ii) at 'AAAsf', at a multiple to 10-year government bond yields at that time.

These 'AAAsf' multiples are derived for each country based on the maximum multiplicative increase in 10-year government bond yields recorded over any three-year period since 1974 (capped at 2.5x), with three years chosen as a conservative estimate of the lag from a government bond yield trough to a peak. For the other rating cases, the results are derived by equal ratio interpolation between the 'Bsf' and 'AAAsf' country cap rates (see below). These floors are reflected in the country cap rates table below.

PMRP Country Cap Rates (Before Any Premium on Valuation Yield) (%)[a]

Country	AAAsf	AAsf	Asf	BBBsf	BBsf	Bsf
Austria	7.94	6.87	5.95	5.15	4.45	3.86
Belgium	8.84	7.64	6.60	5.70	4.92	4.25
Denmark	8.86	7.68	6.66	5.78	5.01	4.34
Finland	11.71	9.87	8.32	7.02	5.91	4.99
France	8.10	7.13	6.28	5.54	4.88	4.30
Germany	8.52	7.24	6.16	5.23	4.45	3.78
Ireland	10.05	8.85	7.79	6.85	6.03	5.31
Italy		11.00	9.29	7.84	6.62	5.58
Netherlands	8.56	7.39	6.38	5.51	4.76	4.11

PMRP Country Cap Rates (Before Any Premium on Valuation Yield) (%)[a]

Country	AAAsf	AAsf	Asf	BBBsf	BBsf	Bsf
Norway	8.26	7.32	6.48	5.74	5.09	4.51
Portugal		10.55	8.72	7.21	5.96	4.92
Spain	12.23	10.35	8.75	7.41	6.27	5.30
Sweden	9.60	8.04	6.73	5.63	4.72	3.95
Switzerland	6.64	5.68	4.86	4.15	3.55	3.04
UK	9.18	8.02	7.00	6.11	5.33	4.65

[a] The cap rates in the table account for any floors imposed by the 10-year government bond yields at the date of publication. Where the assumptions applied in the analysis differ, to reflect future 10-year government bond yield developments, Fitch will disclose the applied cap rate assumption in its RAC.
Source: Fitch Ratings

We recognise that local markets may present particular dynamics that are not best reflected by the national level cap rates. If appropriate granular data is available, Fitch will take them into account in conjunction with its country cap rates in order to derive location-specific assumptions.

A final adjustment is made to the country cap rate to determine the portfolio rating cap rate in order to reflect nuances in the actual PMRP portfolio identified by the valuer (that cannot be reflected in national yield data). The most recent quote of gross (before transaction costs) market value of the PMRP portfolio (shared with Fitch at the time of assigning a new rating, and potentially subsequently) is used alongside the modelled net rent (stabilised gross income minus applied costs assumption) to calculate the net initial yield of the portfolio at that date. Fitch's 'Bsf' country cap rate (derived for the same period) is subtracted from the portfolio net initial yield. If positive, this premium is added to the country cap rates applied in each rating case in the modelling of the portfolio. In this way, a reliable measure of an appropriate risk premium is retained in Fitch's rating analysis, for each rating case.

For portfolios that have high vacancy that the valuer is confident can be substantially re-let or are subject to special regulations that a valuer is confident will be relaxed (e.g. rent controlled), the net initial yield may cease to be a useful marker of the risk premium for the purposes of a rating analysis. For these portfolios, Fitch may therefore apply a higher cap rate premium which, if applicable, will be selected by benchmarking against a yield selected between the net initial yield and the net reversionary yield (the latter being higher as it is derived on the basis of full occupancy).

When there is a significant time difference between the most recent value and rent quotes, Fitch will apply expert judgment in determining the appropriate cap rate premium.

The portfolio cap rates are used to capitalise stressed net operating income consistently with other assets, with non-residential income subject to a 1.2x cap rate multiple at each rating case.

The bond yields that form the basis of this methodology are seen as the equivalent rate of return an investor would require when bidding for a property purchase. Bond transactions would incur immaterial transaction costs compared to property sales. Therefore, the bond yields reflect the total amount an investor would be willing to pay for such an acquisition, inclusive of any transaction costs they are liable for. As in other asset types, transaction costs as described in 7 are deducted from the buyer's value in order to arrive at the amount the seller receives, which informs our recoveries.

UK Purpose-Built Student Accommodation

UK student housing has much in common with PRS, with short-term leasing, a granular tenant base and high running costs. There are aspects of the analysis that are in common with the approach taken to PMRP, but with some important differences to reflect its nuances. For UK collateral, adjustments to this approach reflect nuances such as its niche within the local housing market, its limited use and its dependence on local universities for demand. Given these nuances, loans that permit student housing property substitution are capped in the 'Asf' category.

In the UK, there is a record and supporting data for the PBSA sector. This market developed in the context of structural changes in student housing, with university housing stock generally failing to keep pace with rising student numbers, and compounded by a revival in occupational demand for inner-city PRS housing.

The analysis resembles that of PMRP, starting from gross income (consisting of term and summer room revenue and sundry income) identified from historical cash flow data provided by the arranger. Idiosyncratic factors could influence the historical information (e.g. disruption of the letting cycle, refurbishment) without permanently impeding the income generation potential of a PBSA property. Fitch will assess the impact of such factors in its determination of stabilised gross income assumed as ERV.

The main cost items associated with PBSA (e.g. operating costs, marketing, property management fees and lifecycle sinking fund contributions) typically range between 30% and 35% of gross revenue. Should detailed cost data (covering at least two years) not be available or be viewed by Fitch as inaccurately reflecting the long-term requirement (on an "arms-length" basis), assumptions for costs may vary from the most recent data, but will typically be floored in line with wider market observations and no lower than 35% of portfolio gross revenue. Cost assumptions are applied as a capital cost (i.e. as depreciation of ERV).

Cap Rates by UK PBSA Region (%)

Case	AAAsf	AAsf	Asf	BBBsf	BBsf	Bsf
Central London	7.80	7.17	6.58	6.05	5.56	5.11
Regional	8.40	7.81	7.27	6.76	6.29	5.85

Source: Fitch Ratings

Despite being heavily weighted by term room revenue, total gross income also includes non-core items like summer lettings (e.g. for language studies or pre-course sessions) and sundry income (e.g. vending machines). The resilience of such income streams is not exclusively linked to the same factors that drive term room take-up and as such they are characterised by greater uncertainty. To capitalise such income, Fitch increases the PBSA cap rates by 1.25x to account for this greater volatility.

Market Factors

Comparing PBSA with PRS provides evidence of local market premiums that students ascribe for PBSA quality/specification based on markers such as distance from faculty, private versus shared amenities, and provision of additional services such as Wi-Fi or gyms. Fitch views market premiums as relevant in its assessment of stressed revenue.

RVD and Unadjusted Base SV by UK PBSA Region (%)

Region	Unadjusted Base SV	AAAsf RVD	AAsf RVD	Asf RVD	BBBsf RVD	BBsf RVD	Bsf RVD
East Midlands	5.00	16.00	14.49	14.49	14.49	14.49	14.49
East of England	5.00	16.00	12.00	8.00	7.05	7.05	7.05
London	5.41	16.00	12.00	8.72	8.72	8.72	8.72
North East	5.00	16.00	12.00	8.00	6.00	5.00	5.00
North West	5.00	16.00	12.00	8.00	6.00	5.00	5.00
Scotland	7.34	16.00	12.00	8.00	6.61	6.61	6.61
South East	5.00	16.00	12.00	10.85	10.85	10.85	10.85
South West	5.00	16.00	12.00	10.04	10.04	10.04	10.04
Wales	5.00	16.40	16.40	16.40	16.40	16.40	16.40
West Midlands	5.59	16.00	12.00	8.00	8.00	8.00	8.00
Yorkshire	5.00	16.00	12.00	11.47	11.47	11.47	11.47

Source: Fitch Ratings

To derive a stabilised market premium in rental value per bed for the different regions of the UK, Fitch refers to regional PBSA and PRS rental time series data (starting in 2011), and calculates the excess in the average value of the former (after adjusting it down for the additional costs PBSA has above PRS) over the latter (which denominates the ratio). Fitch views annual growth in average regional PBSA rent in excess of 5% as likely to be driven by unsustainable factors and therefore sets this aside when calculating the stabilised market premium.

By adding the stabilised market premium to the corresponding prevailing regional PRS rental value (a composite weighted by type of accommodation in order to be broadly comparable), an adjusted PBSA rental level is derived. For each region, adding the percentage excess in prevailing PBSA rents over the adjusted level, if any, to the UK PMRP RVD at the relevant rating level, before flooring the result by the usual guidance RVD floors (between 2% and 16% for Bsf through AAAsf), determines the applicable PBSA RVDs.

In Fitch's view, strong PBSA markets are those that efficiently supply beds to meet demand, as denoted by having a lower market premium. Fitch judges such markets as conveying lower risk of experiencing either a surge in supply or a withdrawal of demand. From this standpoint, PBSA in such markets should endure less erosion in rental values as a result of compression in the market premium. Fitch has calibrated its SV assumptions to reflect its view that competition facing UK PBSA could cause rents to converge with PRS levels in a severe student housing market shock. Fitch has assigned each PBSA market an unadjusted base SV rate in order that in an 'Asf' rating case, the market premium for reasonably good properties (scored '3') serving universities ranked in the top 15 is extinguished.

For better-quality assets a premium may survive this stress, while for worse ones it may fall into negative territory (i.e. a discount).

In increasing interest rate scenarios, RVD assumptions applicable to UK PBSA properties are flat across ratings and equal to 'Bsf' RVD.

Idiosyncratic Factors

Specific to each PBSA asset are potential risk factors informed by its catchment area that are arguably more varied than for traditional CRE, and which cannot be captured in the underlying regional data informing the market analysis. These idiosyncratic factors include the appeal of universities (as judged from *The Times* and QS UK university rankings) and size of the undergraduate student population; the micro-geography of the accommodation (as judged by factors such as walking distance to facilities and access to public transport); and any contractual arrangements with local educational institutions (such as nomination or referral agreements).

These factors, along with measures of creditor exposure to a catchment area as well as to individual assets, are considered in the analysis of individual PBSA assets, either by adjustments to the base SV or the property score, as applicable. Following these adjustments, which are described below and specified in tabular form, in line with other CRE the adjusted base SV falls between 5% and 10% (inclusive) and the property score between '1' and '7'.

The substance of Fitch's PBSA scoring is similar to its approach to PMRP: a PBSA property is scored on the basis of (i) the number of full-time undergraduate students in its catchment area, informed by available data prepared by HESA or similar providers, and (ii) the concentration of the town or city catchment area in which the property is located within the PBSA portfolio securing the loan (with both numerator and denominator measured as number of beds). For fully sequential multi-borrower transactions, a lower measure of geographic concentration may be applied for any student housing loan to reflect a larger aggregate PBSA portfolio, particularly for more senior notes.

Guidance Property Score by Student Population and Concentration

Student Population	A <30%	B 30%-50%	C >50%
A (>35,000]	1	2 (1 if pop>100,000)	4 (2 if pop>100,000)
B (35,000-15,000]	2	3	5
C (15,000-7,500]	3	4	6
D (<7,500)	4	5	6

Source: Fitch Ratings

Attributes that can be controlled by the operator, such as provision of Wi-Fi or gym services, or room fit out, are not explicitly adjusted for asset by asset, and influence the cash flow analysis by virtue of their impact on prevailing revenue and costs. In Fitch's view, the market premium achieved by a direct let PBSA asset is frequently tested and therefore closely calibrated to market competition. The risk of an abrupt revenue decline may relate to (i) a potential influx of new student beds in the catchment area, as driven by the magnitude of aforementioned stabilised market premiums (since the PRS is often competing for building lots); and (ii) the resilience of demand for local university places, as influenced by rankings and informed by the size of the student population. These risks are captured by the SV and scoring approach explained so far.

However, another source of revenue risk stems from changes to or lapses in prevailing contractual arrangements with higher education institutions, such as guaranteed nomination/referral agreements. Such agreements are potential markers of structural or asset weakness to the extent they signal a willingness of the operator to insure itself against market volatility. Moreover, these contracts often include an inflation linkage that increases the size of potential reversion to market norms upon renegotiation or if the agreement lapses.

Fitch may increase the score assigned to assets subject to such agreements based on the number of beds under contract. This is other than where Fitch expects income to be well aligned with direct let rates (e.g. direct let evidence from the same property, evidence that local PBSA rents have not fallen since the agreement was struck), and/or in the case of such agreements postponing market reversion long enough after legal final maturity of the debt. An increase in score of '1' or '2' is applied if the proportion of beds allocated is greater than 30% or 50% of the asset's capacity, respectively.

The property score is further adjusted to account for asset concentration, on the premise that a greater exposure to any single asset indicates greater idiosyncratic risk. However, Fitch only adjusts for large asset exposures (over 10% of total beds) if the asset in question also represents over half the portfolio exposure to that catchment area (in which case the property score is increased by one). This approach reflects that diversification within a given catchment area affords overall protection from adverse changes in local supply or demand capable of disrupting any single asset within it.

Quality Assessment Factors

Adjustment factor	Classification	Base SV adjustment (%)	Score adjustment
Local universities	No top 15 in either rankings list	+1	0
	No top 35 in either rankings list	+2	0
	No representation in either list	+3	0
Micro-geography	e.g. walking distance, access to public transport	Case by case	0
Nomination/referral agreement	Between 30% and 50% of beds of the asset	0	Up to +1
	>50% of beds of the asset	0	Up to +2
Asset concentration	>10% of total portfolio beds and >50% of portfolio beds in the same town/city catchment area	0	+1

Source: Fitch Ratings

Credit-Linked Transactions

Other non-standard CMBS transactions are those backed by portfolios of assets let to single, often highly-rated, tenants on very long leases. Where the notes are scheduled to be repaid in full out of rental income, their rating may be credit-linked to the tenant. The analysis of the lease agreement is therefore of paramount importance in rating these transactions: Fitch will expect these to be on a "full repairing and insuring" basis. Furthermore, to guarantee the periodic payments due under the rated bonds, the rental payments would have to continue even in the event of damage or destruction of the assets. These are sometimes known as "hell-or-high-

water" leases, where the tenant carries every (imaginable) real estate risk related to the property.

If these lease covenants are considered "onerous" for the tenant, the ability to enforce them may be limited. Where "loss of rent" and reinstatement insurance is in place, Fitch considers whether the duration of these payments will be sufficient to support debt-service payments while the property is being reinstated.

In cases where these lease obligations are bolstered by cross-default provisions as against a rated entity's financial liabilities, the lease is "bondable" and therefore its credit quality is considered equivalent to the entity's Issuer Default Rating (IDR). Please see Appendix 11 for more details on when this analysis applies or instead when that applicable to Income Strips does.

When debt service (including full repayment) of the notes is found to be dependent on contracted income from a single Fitch-rated entity, and a combination of stressed collateral value secured by the mortgage and structural liquidity is insufficient to mitigate this dependency, the rating is linked to the credit tenant, and not informed by use of Fitch's EMEA CMBS asset model.

Hybrid structures in which debt is scheduled to be only partly repaid from rent require residual value analysis in order to assign ratings to the entire debt quantum. Fitch will give little credit to such residual value if realisation is scheduled too far into the future, when there is less certainty about the operating quality of assets and/or the analysis becomes one of land value. If balloon risk at bond maturity is considerable, Fitch may decline to assign ratings to the transaction.

Summary of CRE Assumptions

Assumption/consideration	Stressed by rating category (Y/N)
Durability of current income	Y
RVDs	Y
Capital expenditure/depreciation costs	N
Structural vacancy	Y
Irrecoverable costs	N
Positive sundry cash flows	Y
Cap rates	Y
Property transaction costs	N
Foreclosure timing	N
Foreclosure costs	N
Source: Fitch Ratings	

Loan-Level Analysis

It is true that the collateral is the main driver of CMBS performance, and that an attractive property able to generate stable income over a long enough time horizon is normally capable of mitigating other market risks. However, this will also depend on the structure of the loan. In its simulations, the agency replicates the loan's main features and assesses its performance under stressed environments.

The credit enhancing potential of performance-related triggers and covenants that trap or "sweep" excess rent is recognised qualitatively in Fitch's CRE loan ratings, although in CMBS analysis we typically give no credit to additional amortisation given it requires tests being breached in advance of loan default (which is frequently driven by maturity).

Additional junior tranches of borrower (rather than issuer) group debt backed by the same collateral may add complexity by introducing additional parties upon loan workout. Moreover, the flexibility envisaged in some loan agreements in terms of property substitution, development or capital expenditure programmes creates additional uncertainty and may lead to lower ratings.

The interest rate or inflation hedging strategy also influences the agency's analysis, since interest rate or inflation swaps pose additional risks in the event of a default during the term of the derivative. The next section details how Fitch addresses these factors.

Modelling Loan Payments

Once the net property income and the net property value have been derived, the next step of Fitch's analysis is to compare the income generated by the collateral against debt service payments under the loan financing.

The priority of payments, the presence of performance-related triggers and the total debt structure are the main inputs in this cash flow analysis. The review of the loan agreement and of the loan structure will allow the agency to model the loan payments over time.

In the simplest case, where a whole loan is backed by very stable cash flows, this exercise is relatively easy: at each loan payment date, the net rental income will be sufficient to pay interest on the loan and then the scheduled principal amortisation. At loan maturity, Fitch's stressed property value will be compared to the outstanding facility amount. If the stressed value is sufficient to repay the debt, the agency will assume an orderly sale of the asset. If this is not the case, the enforcement process will bring with it additional costs and add to the time needed to sell the property.

Borrower waterfalls often contain complexity in the form of performance triggers. If breached, the release of cash flow in excess of scheduled debt service back to the borrower is usually restricted or suspended, with excess cash either "swept" (i.e. used to amortise debt) or trapped in a pledged bank account. If this de-levering mechanism fails to cure the breach, the loan may default instead and become immediately due and payable. Unless the debt is rescheduled in some way, a work-out process will commence, which introduces additional unknowns that further complicate the analysis.

This general description becomes more involved for any "internally" tranched loan that is subject to a contractual inter-creditor agreement that seeks to subordinate one tranche to another (so-called A/B structures). Aside from the implications for enforcement timing of the embedded control/cure rights, the allocation of funds towards interest and principal on the respective tranches is in many cases bespoke to each loan: some A/B structures envisage full subordination of the junior tranche, both for interest and scheduled principal (IP-IP), whereas others treat the tranches as pari passu (II-PP) provided the loan is performing.

As long as the whole loan is fully performing, both tranches will also perform, and there should be little to distinguish the two main types of waterfall. It is only when loans underperform that these arrangements are really tested. IP-IP structures already provide for full subordination of the B-note as soon as a loan is accelerated. However, for II-PP structures, the timing of reversion to IP-IP is critical: some agreements specify as the trigger for a switch in the waterfall "loan acceleration", others a "material event of default" or a breach of covenant, etc.

However, these rules are interpreted by the servicer, weaker A/B structures allow funds to continue to pass to the B-note until the mortgage collateral is actually liquidated – hardly an incentive to speedy resolution if the B note has some control over special servicing. When presented with loans subject to weaker A/B structures, Fitch applies more conservative assumptions, and in extreme cases may cap the proceeds attributable to such an A-note on the basis of total leverage.

In summary, when a CRE loan is subject to contractual subordination provisions the analysis becomes more complex. At any rate, Fitch will model the whole loan balance, applying the loan payments according to its understanding of the priority of payments. Where loan documentation is not backed by comprehensive legal opinions, or where such opinions imply excessive risk surrounding any provision, the agency makes its analysis more conservative as appropriate.

Loan Default

Since the majority of CMBS borrowers are incorporated as bankruptcy-remote SPVs, their propensity to default is primarily determined by the loan collateral performance: the borrower will be in default when the securitised loan is in default. The particular circumstances that will trigger a loan event of default are specified in the loan agreement. Common events include non-payment

of scheduled interest or principal (either before or at maturity), breach of covenants (including in relation to ICR or LTV), inaccurate representations and failure to meet other obligations, such as the provision of timely data. While the latter events are behavioural, the non-payment of scheduled interest/principal and breach of financial covenants are stress-dependent.

A loan covenant breach, commonly referred to as a "technical default", may not trigger an automatic default notice and often results in further negotiations between the servicer and the borrower to agree on a resolution. The same often applies to missed principal payments. In CMBS analysis we typically do not model loan acceleration (and commencement of the recovery process) unless either loan interest is unpaid or the borrower cannot redeem the loan at (final) loan maturity.

Hedging

Floating-rate CMBS have an interest rate mismatch with underlying rent, which is usually hedged by either the borrower or the issuer entering into swap and/or cap agreements.

Subject to swap documentation swaps may be terminated upon loan default, crystallising a termination payment due from one party to the other. Where an amount is owed to the hedge counterparty, the net collateral disposal proceeds available for debt repayment will be reduced accordingly. In Fitch's projections, this typically arises for swapped loans that fail to pay scheduled interest. In its assumed termination payment, the agency adopts a decreasing interest rate scenario drawn from its published interest rate assumptions (see Structured Finance and Covered Bonds Interest Rate Stresses Rating Criteria).

Where interest rate caps are used, although an upfront cost is payable to the provider, neither the borrower nor the issuer would be liable for subsequent termination payments. Consequently, such structures are not exposed to the adverse effects of falling interest rates in the way that swaps are.

The volatility of FX markets makes it extremely difficult to quantify potential mismatches between the two sides of a currency swap. Consequently, Fitch assumes no recoveries under loans subject to senior-ranking currency swap arrangements in scenarios in which the loan defaults.

Fully balance-guaranteed swaps do not expose the structure to the types of market risk described above, which are absorbed by the counterparty. While use of such instruments would exempt the transaction from the analysis discussed above, such derivatives may not be liquid. In addition, borrower-level swaps that rank pari passu with the whole loan are also likely to be considered non-replaceable, owing to the embedded credit risk taken by the counterparty.

Where swap replacement is called into question, in any rating case in which the counterparty is assumed to default, noteholders would be exposed to the risk factor which the swap was supposed to hedge, constraining proceeds rated above this level. Relevant counterparty-related criteria are addressed in the *Structured Finance and Covered Bonds Counterparty Rating Criteria*.

Loan Enforcement

Simulating an enforcement process has implications with respect to both recovery levels and timing. As already mentioned, the time necessary to enforce the security and complete the foreclosure process, and the costs related to it, are very much country-specific. However, loan or transaction-specific considerations are often very relevant in a CMBS analysis: a large property portfolio may require a longer enforcement process, since more parties are involved and more assets need to be sold; complex legal structures may involve additional costs and time to be unwound; or inter-creditor arrangements outside the CMBS structure, particularly where subordination is contractual (rather than structural) and/or mortgage security is common.

Furthermore, additional senior liabilities or enforcement risks could apply as a result of findings from technical, environmental or title reports in relation to the underlying properties, or as a result of contingent liabilities and/or weaknesses of the security package.

Fitch's guidance foreclosure timing assumptions for a specific country have been determined based on market research, information obtained from market participants and legal firms, and historical foreclosure timings observed by the agency for various countries; they are kept

constant across all rating cases. This is the key determinant of the overall recovery timing for each loan, during which default interest accrues in Fitch's analysis. See 7 for the guidance foreclosure periods used for the key jurisdictions.

Longer periods may be assumed for particularly complex cases. In addition to what is explained in the Property Liquidation section, if the tail period between loan maturity and legal final maturity of the notes is too short to cover the agency's recovery timing assumptions, Fitch will apply further haircuts to recoveries and cap its ratings as per Appendix 4.

Foreclosure costs are determined by the regulatory/legal framework applicable in the relevant jurisdictions. When assigning a new rating where there is not an established CMBS market, Fitch may request the issuer legal counsel to provide estimates of foreclosure costs for each loan, and adjust its assumptions accordingly. In the agency's analysis, these are calculated as a percentage of the stressed market value in each rating case. The effect of such costs is straightforward: as these are paid senior to both interest and principal recoveries, they decrease the funds available for debt service.

Should neither the costs be recoverable from the borrower nor covered by issuer reserves/excess spread, a sale of an asset out of special servicing will automatically lead to a shortfall under the notes. Even if a loan amount is recovered in full, these issuer level costs will be payable senior to the notes, leading to an unavoidable loss on recovery. In such structures, the rating will be constrained by collateral value being adequate to avert costly resolution after loan default.

Senior Loan Purchase Option

It is typical for CMBS 2.0 loans to include "non-securitised" leverage in the form of mezzanine financing that is at least structurally and contractually subordinated to the issuer's claim. The presence of a mezzanine lender whose repayment depends on the collateral performance can positively affect the performance of the senior loan by introducing an additional party with resources to support asset management of the portfolio if necessary. However, this positive effect is usually offset by the presence of a senior loan purchase option.

This is because an option that has not been exercised could act as a negative market signal from a party (with accumulated additional information on the collateral) that the property value may be lower than the senior loan (else one may assume it should have been exercised already). In addition, purchase options are accompanied by a set of operational steps to be taken upon particular events materialising. When the conditions under which the purchase option can be exercised are not explicitly defined (for example "enforcement action" can comprise a number of loosely defined circumstances) or when there is ambiguity around when they do not arise, the uncertainty introduced may hinder the ability of the special servicer proceeding with liquidation, and/or reduce the market demand for the collateral.

In its analysis, assuming the contrary cannot be verified, Fitch assumes that the existence of such a purchase option would be known among potential bidders for the portfolio. Besides the signalling effect, wide knowledge of the unexercised option could in itself deter some parties from spending the time and money needed to mount bids, unless there was an expectation that the winning bid would be sufficiently in excess of the senior loan purchase amount. If the financing is secured on a single or small number of "trophy" properties all scored '1' or '2', Fitch may set aside these weaknesses on the basis that asymmetry of information is less relevant.

In summary and subject to the considerations above, where a purchase option is not sufficiently time-bound to extinguish it ahead of enforcement and its activation is limited by events that are not adequately defined (e.g. where there is no strict time limitation from the commencement of the earliest enforcement action), Fitch rates the first loss debt (for CMBS, wherever this is driven by the loan subject to the purchase option) at a level assumed to render the purchase option redundant, which is typically one notch lower than it otherwise would.

While an actual exercise of the purchase option might be assumed to be credit positive for the issuer, in some cases the senior loan purchase amount would not rule the issuer out from suffering shortfalls associated with the subject loan being in default, e.g. enforcement costs and/or accrued loan default penalty interest may not be included in the purchase amount. When this is the case, Fitch may lower the rating to the scenario in which the loan does not default.

Loan Maturity: Orderly Sale vs. Enforcement

	Maturity	Enforcement							
Quarters after maturity	0	1	2	3	4	5	6	7	8
Stressed property cash flow (GBP) (a)	166,901	252,785	287,951	308,434	299,622	249,626	211,461	213,200	204,450
Stressed property value (GBPm) (b)	10.29	10.32	10.28	10.22	10.13	10.04	9.99	9.97	9.87
Balance outstanding (GBPm) (c)	10.00	9.96	9.96	9.96	9.96	9.96	9.96	9.96	9.96
Enforcement cost (GBP) [d = 2%*b]	n.a.	199,162	199,162	199,162	199,162	199,162	199,162	199,162	199,162
Special Servicing Fees (GBP) [e =0.25%/4*c]	n.a.	6,225	6,225	6,225	6,225	6,225	6,225	6,225	6,225
Scheduled/accrued interest (GBP) (f)	125,000[a]	298,800[b]	352,607	371,808	370,487	378,202	437,645	538,182	639,943
Interest paid (GBP) [g = min (a-e, f)]	125,000	246,560	281,726	302,209	293,397	243,401	205,236	206,975	198,225
Interest shortfall (GBP) [h =f-g]	0	52,240	70,881	69,599	77,090	134,801	232,409	331,207	441,718
Loss rate (%) [i =(b-c-d-h)/c]	0.00	0.00	0.00	0.09	1.07	2.55	4.03	5.22	7.34

[a] Calculated at 5% interest rate
[b] Calculated at 12% interest rate per annum + interest shortfall of previous period accruing at 12% per annum
Source: Fitch Ratings

Loan Maturity

If a loan does not default during its term, Fitch will compare the stressed property value at maturity to the outstanding debt amount secured under the mortgage. In identifying loan maturity, Fitch assumes all contractual extension options available to the borrower are exercised, which acts as additional credit to scheduled amortisation.

If the property value is sufficient to cover the securitised debt amount, Fitch assumes that a rational borrower (including if control in it has passed to a mezzanine lender) would undertake an orderly sale of the properties in order to protect its stake in the collateral. In this way, cost and timing penalties associated with enforcement – which may otherwise depress recovery proceeds – are avoided.

It is possible that portfolios generating a significant amount of income would benefit from a loan default as cash sweep collections could more than exceed any default and enforcement associated costs. Fitch may include such theoretical additional amounts, if available, in its calculation of recoveries if they are not already taken into account otherwise. Where the stressed property value is not sufficient to cover the debt amount, a loan enforcement process is simulated, as detailed in the previous section.

The table compares an orderly sale at maturity with an enforcement scenario.

Loan Flexibility

Whenever a loan agreement allows for flexibility in its terms, additional analysis is performed for typical standalone private equity-sponsored borrowing vehicles (i.e. those that do not use the securitisation as an "evergreen" funding platform for the sponsor group). A complex form of flexibility is the presence of substitution clauses, which may alter the loan collateral composition after transaction closing. Some loan agreements seek to cancel out these potentially adverse effects by imposing very strict substitution criteria.

Where portfolio migration may be material, Fitch constructs a "dummy" property portfolio with weaker characteristics, as permitted under the loan terms, in order to capture possible deterioration over time. As a general rule, the agency assumes increased concentrations in riskier property types and locations, as well as shorter lease terms, lower tenant credit quality and loss of reversionary potential, to the extent that such changes are permitted.

Fitch also accounts for loans that allow leverage to increase in line with general property values: a borrower able to release an asset that has appreciated in value and replace it with another valued at the other's previous value is releasing equity. If this flexibility is permitted for assets appreciating simply on the back of general improvements in market sentiment, this could allow for significant (if hidden) increases in loan leverage over its term.

As a proxy for the additional credit risk, the agency assumes an upfront loss in collateral ERV, proxying for the sponsor exploiting a foreseeable compression in yields from their prevailing level, as informed by historical data. We may also increase RVDs to reflect the sponsor exploiting potential overheating in rental conditions. These considerations equally apply to loans permitting further drawdown ("value taps") governed by LTV and ICR tests.

The analysis of loans that allow for significant substitution will also have to assess the risk that deterioration in collateral quality could affect ratings. Therefore, a loan backed initially by high-quality assets, but with loose substitution criteria, would fare substantially worse in Fitch's analysis than the same loan without such flexibility. Where flexibility cannot be quantified with confidence in Fitch's analysis, a rating cap may be applied.

A simpler and more common form of flexibility is property disposal. Typically, each property will have an allocated loan amount (ALA) representing its pro rata share of the loan. A borrower releasing a property from the security net will have to pay the issuer a "release amount" consisting of a release premium (RP) in addition to the ALA. If the release amount is over 100% of ALA, headline loan LTV will fall as the property portfolio shrinks.

Having higher RPs for the strongest properties mitigates the risk that borrower actions leave a loan secured on a weaker or more concentrated rump of properties. Risk factors that are unidentified at origination may later become visible to the borrower, making release pricing critical. For a loan secured on assets presenting potential idiosyncratic risk, safeguarding portfolio diversity is a key creditor protection. For this reason, excessive competition over release pricing is a risk for CMBS investors.

Property disposal mechanics are normally fairly simple, with traditional CRE loan structures requiring repayment of a pre-determined loan amount upon sale or release of a property. However, we have encountered loan structures that envisage dynamic recalculations of any of the components of the release price, based on, e.g. cumulative loan repayments and cumulative release premiums. These add complexity to the analysis.

Additional analytical complexity stems from the interaction of property disposal with CMBS principal allocation rules. See the Analysis of Credit Enhancement section below for Fitch's analytical approach for these risks.

Other elements of flexibility may relate to specific sponsor business plans, for example, value-enhancing capital expenditure programmes with debt-funding, where we may assume a broadly neutral impact on credit on the basis that completion should raise debt yield and collateral value.

We typically do not give credit to borrower-led disposal plans as a means of debt repayment, or other features that rely on sponsor strength or commitment.

Liability Analysis

This section covers a variety of tests that Fitch applies either in running its EMEA CMBS asset model or as additional tests using outputs of that model. These tests are independent and, where they are run outside the EMEA CMBS asset model, they use the EMEA CMBS asset model output associated with the MIR as a starting point. Therefore, this section only applies when assigning new ratings or in reviews of existing ratings in respect of which the EMEA CMBS asset model is run.

Excess Spread

Where Fitch recognises CE from excess spread for CMBS that capture excess issuer revenue (net of note interest) as senior note principal, for loans in default, credit is typically limited to the senior class of notes. Unlike junior classes, the impact of rising funding costs (as collateral is progressively liquidated) is directly offset by note amortisation. When transaction features

reduce the risk of margin compression (e.g. single property deals), Fitch also extends this approach to junior notes.

Where credit is given to excess spread (i.e. in the scenario corresponding to the rating of the class), Fitch calculates the weighted average note margin (excluding issuer senior expenses modelled elsewhere, see *Senior Fees* below) applicable to the start of the EMEA CMBS asset model run, and treats the loan(s) as having this margin rather than the documented loan margin(s). For multi-borrower transactions, Fitch will consider the impact of prepayments and transaction waterfall mechanics when assessing potential credit to excess spread (for any class).

While the EMEA CMBS asset model is a loan-level cash flow model, this approach to excess spread reflects that in the circumstances described above (and holding loan default timing constant) when determining stressed note proceeds there is no analytical difference between excess spread (swept as note principal) and excess rent (swept as loan principal), provided both are applied sequentially upon loan default.

Besides this, Fitch's liability analysis is designed to test (1) the effect of prepayment (including via property disposal) on CE and on note interest coverage and (2) the risk of payment interruption.

Analysis of Credit Enhancement

The starting point of each component of Fitch's credit enhancement analysis is the MIR, to which Fitch carries out tests to determine the effect of property disposals and loan repayment. As a minimum, the following tests apply (to notes rated at investment grade in low and stable interest rate scenarios), with 1 preceding 2:

1.   Disposals

  -   For each loan, Fitch identifies (in the rating category related to its break-even asset modelling) those properties with a higher stressed MV than release amount, i.e. properties that, if released, would still return equity to the sponsor under the corresponding rating category stress.

  -   Where the adjustments to the borrowers' assets and liabilities are based on static rules, these properties can be identified without regard to sequence, allowing Fitch to test the impact on model outputs assuming these properties are released, after reducing the loan amount accordingly and adjusting the CMBS note balances to reflect the paydown rules.

  -   For complex, dynamic loan structures where repayment rules are recalculated, the disposal test may entail a bespoke analysis initially, to quantify the appropriate haircuts per property to reflect these risks over the life of the rating (or until such time as a new bespoke analysis is conducted). Fitch may re-run its EMEA CMBS asset model as part of its disposal analysis.

  -   Where multiple properties secure a single-borrower CMBS, an additional disposal test is run for notes to be rated 'AAAsf': For each such note, Fitch assumes properties are disposed of in reverse order of 'AAA'-stressed market value decline until such point as the 'AAA' stressed note to value ratio peaks, before testing the rating impact.

  -   Property disposals are contingent and their impact is usually reversible in cumulative terms. Given this, for each class of notes Fitch's ratings will be driven by the MIR provided this does not result in ratings more than three notches above the result of the disposal test(s). In cases where the number of properties "selected" for disposal is five or fewer, the number of notches above the result of the disposal test(s) will be less than three and as low as zero, depending on the composition of the property portfolio.

2.   Loan repayments (for multi-borrower CMBS)

-       Fitch identifies in its asset modelling loans which would return to a class of notes more principal from mortgage recovery proceeds than from loan repayment distributions. Fitch assumes these loans repay and adjusts the CMBS note balances to reflect the paydown rules. This is tested on the loan pool both pre- and post-property disposals (see test 1).

-       For complex, dynamic CMBS structures where paydown rules are recalculated, the repayment test may entail a bespoke analysis initially, to quantify the appropriate haircuts per loan to reflect these risks over the life of the rating (or until such time as a new bespoke analysis is conducted). In some cases, the test may simply involve identifying suitable static "benchmarks" (e.g. pro rata and modified pro rata) that create a range within which the outcome of the dynamic rule would be expected to fall. Fitch may rerun its EMEA CMBS asset model as part of any bespoke analysis.

-       Where "voluntary loan repayments" (i.e. from sponsor equity injection) can be allocated on a reverse-sequential basis, Fitch will test whether this reduction in credit enhancement offsets the removal of credit risk for any particular class.

-       Where the loan repayments test produces a negative impact on the asset model result for a particular class of notes, then it will constrain Fitch's rating analysis for that class.

Notes Payment

Fitch's liability analysis also tests for the receipt of coupons by noteholders in the relevant rating cases. In this way, the protections envisaged by the transaction legal structure are tested against the agency's stresses. Interest shortfalls on the notes may be caused by the following.

Senior Fees

The lumpiness of CMBS portfolios may also destabilise senior expenses, payable before any note interest. The main cause of volatility is the compensation due to the special servicer (additional to the senior expenses): if a loan defaults and gets transferred to special servicing, an additional periodic fee is invoiced.

Senior Fee Guidance Assumptions

	% on outstanding pool balance, per annum
Senior expenses[a]	0.20[b]
Special servicer fees[c]	0.25

[a] Senior expenses may not be modelled in single loan or pro rata multi-loan CMBS where the loan coupon(s) is sufficient to cover issuer operating and finance costs in full (and where the loan coupon(s) is modelled). For 'agency' CMBS where the loan margin(s) is set at the WA note margin, and the borrower indemnifies the issuer for senior expenses, we would model senior expenses
[b] For loans subject to possible safeguard proceedings (procedure de sauvegarde) in France, Fitch may increase senior expenses to account for the risk of lengthy moratoriums and increased legal expenses.
[c] In the EMEA CMBS asset model, special servicer fees are not modelled in cases where loan default penalty interest (of at least 0.25%) is modelled
Source: Fitch Ratings

As not all fees are based on the outstanding balance of the transaction, the proportion of fees to note balance may increase significantly in a piecemeal disposal of assets, leading to shortfalls even for senior notes. If no provisions are made to cover for increasing fees in a disposal scenario and shortfalls are expected also for senior notes not subject to available funds caps, Fitch may not be able to assign ratings to the notes. In addition, a one-off payment, usually based on recovered amounts, falls due at the end of the work-out process. Subject to the waterfalls, these costs may cause either interest shortfalls at the bottom of the capital structure or reduced principal recoveries.

Even if these costs are ultimately recovered from collateral sale proceeds, a reliance on interest cash flows to cover increased costs may cause temporary interest shortfalls, which Fitch addresses in its testing of the liquidity facility as detailed in the following section.

Margin Compression

Fitch will assess whether loan repayment combined with paydown rules could result in debt-service shortfalls. The risk of available funds being insufficient to pay interest on all the notes primarily affects the most junior classes of notes. Some junior notes are therefore structured with an "available funds cap" (AFC) which effectively limits interest payments to the amount available, extinguishing any claim to missed interest. In its performing rating stresses, i.e. above 'CCCsf', the rules listed below are applied.

- Fitch ranks the loans from high to low margin.

- Fitch determines the minimum proportion of each loan that should be allocated sequentially (the sequential amount). Where paydown rules are dynamic, this would involve estimating a suitable static proxy, or performing a bespoke analysis.

- In testing a particular tranche, Fitch runs two sets of calculations:

  - Full tranche remaining

    ◆ The "effective margin" is determined by adding to its balance (including pari passu notes) the aggregate balance of the tranches ranking junior (excluding any write-downs). Into this combined balance is divided the product of the balance and the margin of the tranche in question (or zero, if the tranche is subject to an available funds cap).

    ◆ The sum of tranches ranking senior is the target repayment amount.

  - Nominal sum remaining

    ◆ The "effective margin" is determined by adding a nominal sum to the aggregate balance of the tranches ranking junior (excluding any write-downs). Into this combined balance is divided the product of the nominal sum and the margin of the tranche in question (or zero, if the tranche is subject to an available funds cap).

    ◆ The sum of tranches ranking senior is added to the balance of the relevant tranche, less the nominal sum. This is the target repayment amount.

- For each set of calculations, Fitch sums the sequential amounts according to the ranking of the loans until the target repayment amount is reached and reduces the corresponding loan balances accordingly. If the target repayment amount is not reached, Fitch repeats this for the non-sequential amounts, according to the same ranking.

- Once the target repayment amount has been deducted from the loans, the weighted average margin, less senior costs, is compared with the effective margin. If inadequate, the rating will be 'CCCsf' or below.

Provided this test did not constrain any ratings at closing (and provided the issuer's costs are in line with Fitch's expectations), Fitch will not repeat this test as part of the surveillance process.

Liquidity Support

Fitch tests in its applicable rating cases that each class of notes can receive interest and principal payments in accordance with the terms and conditions of the transaction documents, commensurate with its rating, as described in the *Global Structured Finance Rating Criteria*. The detailed tests employed are specified in Appendix 9. These tests do not address payment interruption risk as contemplated in *Structured Finance and Covered Bonds Counterparty Rating Criteria*, which is typically mitigated by having access to adequate liquidity support. In the following bullet points we summarise some general considerations made in our testing.

- Non-investment-grade tranches are subject to the liquidity tests only when non-deferrable (currently or potentially). Accordingly, non-investment-grade tranches that are permanently deferrable are not subject to any further rating constraints resulting from liquidity considerations.

- Portfolios with lumpy lease profiles are subject to greater risk of rental interruption should any tenant vacate or stop paying rent. In such cases, Fitch may temporarily

reduce stressed portfolio income available for note debt service to account for potential void periods.

- Fitch tests the ability of non-senior-ranking, deferrable tranches to meet timely payments only if and when they become senior and non-deferrable as a result of principal repayments. In this test, Fitch reduces issuer collections proportionately to the debt reduction required to make this tranche senior.

Negative Pooling

A separate deterministic portfolio test is performed by Fitch to reflect the risk of "negative pooling" on the MIR only (in other words it is not additive to any other adjustments or tests that may apply to the MIR in the criteria). As more loans are pooled together, junior-ranking note holders become increasingly exposed to the risk that the performance of any loan could deviate from projections. Although any such deviation may reasonably be expected to apply in either direction, for first loss debt investors, any losses recorded on one loan cannot be offset by excess recoveries on others. This makes the first loss tranche the most exposed to negative pooling. Fitch assesses negative pooling only in CMBS with at least five loans - see Appendix 10 for further details.

Assigning Different Ratings than Model-Implied Ratings (MIR)

The MIR represents the highest rating case in which a class of notes performs under all applicable interest rate scenarios at the time the EMEA CMBS asset model was last run, before adjusting for disposals, prepayments, liquidity, WAM compression, negative pooling, senior loan purchase option and borrower default risk[1]. For the avoidance of doubt, rating caps (e.g. from counterparty risk (where applicable) are reflected in the MIR.

The committee may assign ratings that are different from the MIR, by up to and including three notches higher or lower if it believes that drivers of the MIR have a significant likelihood of being reversed in the near term.

Additionally, the committee may assign ratings that are different from the MIR by greater than three notches if there are specific risks (other than rating caps) that the committee believes are not adequately addressed using the EMEA CMBS asset model (including from disposals, prepayments, liquidity, WAM compression, negative pooling, senior loan purchase option and borrower default risk[1]).

Servicer Risk

Servicers and special servicers perform a pivotal role in EMEA CMBS. Given the high concentration risk, underperformance of a single loan may have a noticeable effect on a transaction. A proactive approach and timely intervention of a servicer can have a major effect on the performance and, consequently, the ratings of a transaction. Fitch reviews the capabilities of the named primary and special servicer(s) by reference to an operational review of the same.

CMBS analysis relies on adherence to the "servicing standard" (as defined in each transaction's servicing agreement), i.e. an effort to maximise recoveries for all creditors. Although measuring recoveries is to some extent open to interpretation (in particular, as to the time value of money), servicers are generally expected to treat the serviced debt as a single exposure. The handling of any conflict of interest among different debt tranches is, therefore, secondary to the primary goal of minimising overall loss.

Some comfort on a servicer's intention to adhere to the servicing standard can be gained by reviewing the entity, principally by assessing the value to the servicer of enjoying a good reputation. However, even the most diligent servicer can be obstructed by poor documentation or the involvement of other parties, which calls for an assessment of the extent to which competing pressures can influence the servicing standard.

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[1] Borrower default risk refers to adjustments relating to the CRE Loan Ratings analysis.

Servicer Operational Risk

Fitch assigns Commercial Primary Servicer and Commercial Special Servicer Ratings (CPS and CSS, respectively) to several European servicers; these ratings are reviewed on an annual basis (for details, see *Criteria for Rating Loan Servicers*). If the appointed servicer is not rated by Fitch, the agency will perform a comparable review of its operations in order to assess its ability to perform satisfactorily in its contracted role, thus minimising the effect of operational risk. Fitch either produces a public servicer rating or performs an internal assessment in order to assign CMBS ratings.

Operational Complexity

As noted above, it is not just the identity of the servicer that must be assessed, but also the documentation that imposes duties on the servicer. If strong adherence to the servicing standard cannot be relied on, the agency will apply a rating cap as per 4.

The servicing standard in CMBS transactions represents an attempt to equip servicers with a similar level of discretion as their bank peers, and to ensure that their work-out strategies are shaped by balanced considerations. When well-constructed, the servicing standard should be consistent with the implicit objective of servicers to minimise CMBS credit losses, which should therefore be supportive of ratings.

However, should the wider servicing framework be poorly constructed, it may foster incentives other than, or in conflict with, those compatible with the servicing standard. For example, a servicer's decision to delay liquidation might be informed by seeking to maximise servicing fees or junior cash flows. Fitch notes, however, that at certain times in the economic cycle it may be entirely reasonable for a work-out to be geared towards securing borrower cooperation, even if this means relaxing certain provisions.

In practice, clear evidence of servicing distortion is hard to detect. Consequently, a careful analysis of the documentation is necessary – not to test legal integrity, but to evaluate likely behaviour within contractual constraints. In its analysis, Fitch looks for possible sources of servicing distortion, e.g. the structure of servicer remuneration and any control provisions that allow a particular sub-set of creditors to exercise undue influence over servicing.

The question of creditor control naturally arises when debt is syndicated among various lenders or tranched as in CMBS. Traditionally, for CRE debt tranches, control initially rests with the junior creditor, on the basis that this class represents the first loss piece. In EMEA CMBS, most relevant control powers are limited to "consultation" rather than "consent" rights, allowing the servicer to override any demands it deems unreasonable.

In one crucial respect, however, the authority of special servicers is undermined: they are vulnerable to being replaced at the behest of the controlling class, and therefore may be influenced by the interests of such class. Where holders of notes that are unlikely to be repaid (on the basis of prevailing collateral valuations) can direct special servicing under threat of replacement, the assumed recoveries under Fitch's stresses are much reduced. This is primarily on account of likely delays in enforcement that risk eroding collateral value further.

The issue of control requires careful consideration. Fitch notes an absence of periodic, mandatory collateral appraisal mechanisms in most vintage EMEA CMBS transactions, a fact that has contributed to the level of operational risk in the sector. Such a mechanism may be the basis for managing control rights in a manner that is equitable, and that reinforces – rather than undermines – the independence of servicing.

The lack of automatic annual revaluation presents risks that Fitch takes into account when analysing a transaction's control framework. This would not cover cases where noteholders waive these powers as this represents appropriate noteholder control. Less frequent appraisals within a controlled framework may be "risk neutral" in the case of simple, high-profile collateral with very good proxy data or very granular, static, good quality pools. In other cases, Fitch may cap the ratings in 'Asf' category depending on the composition of the portfolio.

Several additional issues arise for synthetic CMBS. Firstly, the originating bank remains "lender of record" and may therefore retain certain rights with respect to the loan. Even if servicing is performed by the same bank – with a "Chinese wall" between its roles as servicer and lender of record – these functions may well stand in conflict, and result in a failure of the servicing standard. The flow of performance data may also be negatively affected by such Chinese walls. These types of operational risks are discussed in Appendix 4 and may warrant a rating cap.

CRE Loan Ratings

CMBS structures generally envisage the time until bond maturity and the level of external liquidity as both being sufficient to accommodate mortgage enforcement, starting at loan default. However, the analysis centres on the borrower's ability to refinance itself in time when individual loans are rated, or where the tail period would otherwise be a constraint on the CMBS rating. Failure to be refinanced by maturity constitutes a rating default.

The simplest case to judge from a rating perspective is where a borrower is refinanced by a different lender, allowing the previous one to be repaid in full. However, lenders to distressed borrowers often adopt forbearance (amend-and-extend or interest capitalisation) strategies, if they consider this the best route to credit recovery. This does not preclude a rating default action being taken by Fitch if the agency concludes such refinancing or restructuring was not on voluntary (i.e. open market) terms.

Consequently, although Fitch's approach to rating CRE loans builds on the same criteria presented in this report, there are differences. The first task is to test the sufficiency of equity and stressed cash flow to meet timely interest payments, which is critical in securing new financing on a voluntary basis. A borrower has positive equity in a given rating case if the stressed collateral value exceeds its senior or pari passu liabilities at the earlier of the first missed amortisation payment (if any) and the loan maturity.

Loan Rating Flowchart
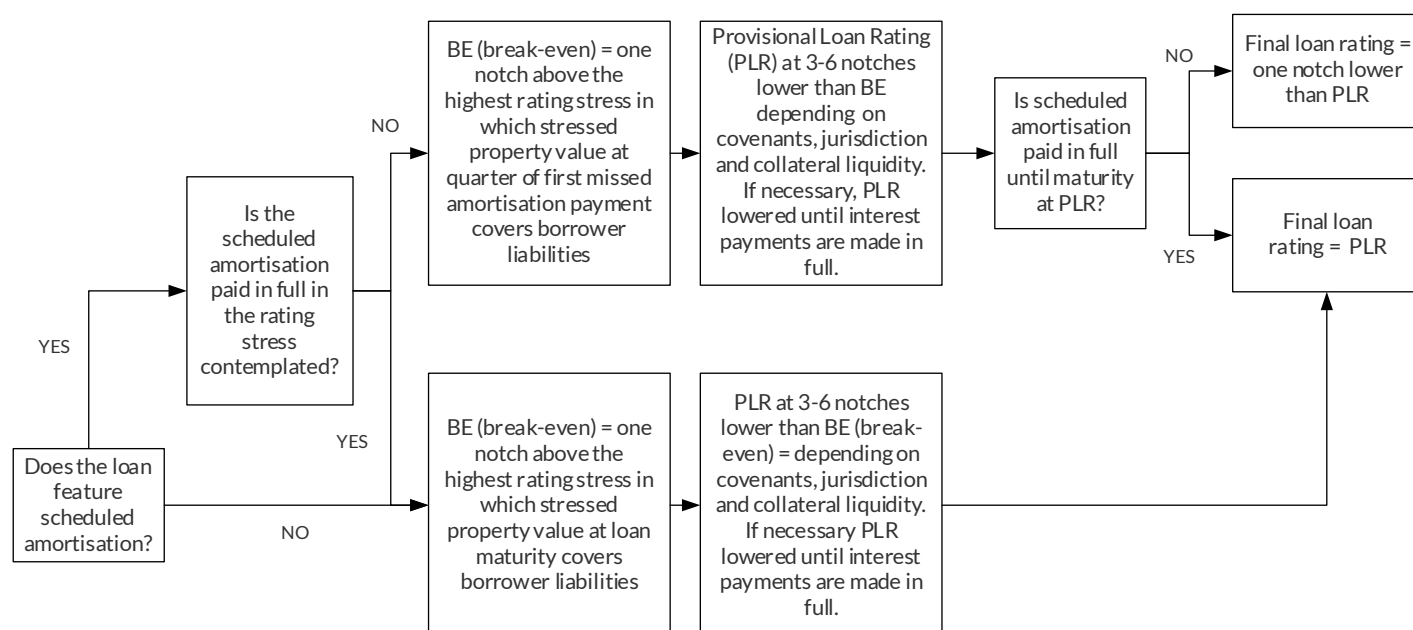
Source: Fitch Ratings

Fitch believes that, with a cushion of two rating categories below the "break-even" level of rating stress (i.e. the lowest rating case in which equity has been exhausted), the rating reflects the probability of the loan being voluntarily refinanced – although loans benefitting from a strong covenant package may require a smaller cushion, as described further below.

The two-rating-category adjustment establishes a rating category cap for non-fully-amortising loans at 'A', which recognises the importance of financial incentives and planning in bringing about a voluntary refinancing at maturity. This two-category cushion also means that for a loan to be rated in the performing categories (B- and higher), its leverage must be consistent with investment-grade recovery prospects.

The second task is to test whether stressed cash flows can also cover timely principal amortisation payments at the provisional loan rating level. If so, the provisional loan rating is the loan rating; otherwise, the loan rating level is one notch lower.

Determination of Provisional Loan Rating Level (Number of Notches from Break-Even)

Fitch may consider reducing the cushion below two rating categories (although retaining the 'A' rating category cap for loans) based on a determination of the following:

1)   Lender protection mechanisms arising from the loan structure and the jurisdiction

For jurisdictions with a strong loan recovery framework (e.g. the UK), the loan structure can provide the lender with a means of accelerating a deteriorating loan without waiting for the borrower to miss a payment of interest or final principal. In particular, Fitch may give credit where a loan's interest coverage and LTV ratio covenants are: regularly tested; and sufficiently conservative and forward-looking to allow for full recovery before loan maturity. In general, this implies that covenants are set at or close to levels on which new lenders would be expected to provide refinancing (i.e. where this does not depend on a significant injection of equity), taking into account stresses to property values and financing costs.

Separately, a high rate of penalty interest (upon loan default) can sharpen the incentive for the borrower to pursue a timely refinancing.

In jurisdictions in which financial covenants and/or penalty interest are binding on and enforceable against borrowers, Fitch will give credit to loans with these lender protection mechanisms by reducing the cushion below two rating categories (up to two notches' reduction). In jurisdictions where the power to enforce financial covenants may not be recognised by the courts, the recovery process may take a long time to complete, and/or penalty interest can be deemed usurious, Fitch does not give full (or if appropriate any) credit to lender protection mechanisms.

2)   Liquidity of collateral

Collateral that can attract a wide range of sources of finance, has solid occupational demand and presents little underwriting uncertainty will tend to be viewed as liquid. For such collateral Fitch may reduce the cushion below the break-even rating by one (more) notch.

Disposal Risk

Fitch analyses the risks associated with property disposals by capping recovery proceeds in the break-even scenario at the release prices that individual property disposals would return to the lender. This is the same general approach applied in rating CMBS, reflecting that the risk of adverse selection and the motives that may be behind borrowers' decisions to dispose apply regardless how the CRE loan is funded. Like the CMBS analysis, Fitch recognises that disposal impacts can offset each other as much as they can accumulate, and therefore are reversible. Consequently, the effect of disposals on the loan break-even will be analysed in line with the considerations described in Analysis of Credit Enhancement.

Senior/Subordinated Loan Structures

When faced with a request to rate the senior piece of a senior-subordinate loan structure, the analysis will hinge on whether or not the subordinated part of the financing is an obligation of the senior loan borrower. If it is, then the borrower's ability to service the junior obligation will be indistinguishable from its ability to perform on its rated loan obligations.

A/B structures (popular before 2008) refer to whole loans subject to subsequent intercreditor arrangements that give rise to contractual subordination of the B-note to the A-note. Both A- and B-notes represent debt advanced to the same borrowing entity, whose ability to refinance is a function of its entire indebtedness. In these cases, Fitch will account for the entirety of debt in determining the break-even against which the adequacy of equity is assessed.

In contrast, a senior-mezzanine setup typically has "structurally subordinated" debt advanced to an upstream shareholding entity rather than to the senior loan borrower itself, delinking the default probabilities of the senior and the subordinate loans, and allowing the two pieces of loan financing to be distinguished analytically.

The presence of junior debt structured as a mezzanine loan diminishes neither senior loan debt service coverage nor equity held in the borrower. Accordingly, the senior loan can perform even as the mezzanine loan defaults, allowing the mezzanine lender to take control of the senior borrower, including its related obligations under the senior loan, by enforcing its share security.

This structure means the incentive to refinance, whether by the original sponsor or a mezzanine lender after change of control, is driven by the senior leverage only – an insight that allows the senior loan to be rated higher than a mezzanine loan. As a result, we can set aside the mezzanine loan from the break-even analysis when rating the senior loan.

As we rate senior loans well below their break-even, unfavourable features, such as senior loan purchase options held by mezzanine lenders that can survive senior mortgage enforcement or be exercised at below cost, would typically not handicap the senior loan rating.

Senior Fees and Transaction Costs

For loan ratings, senior expense assumptions (if any) are only those documented in the loan agreement.

In this analysis the borrower is still a performing entity and therefore Fitch assumes no enforcement costs arise.

Refinancing costs (e.g. mortgage registration and origination fee) may reduce the borrower's equity incentive to organise a timely repayment of the loan. Fitch will reduce its stressed collateral value by an estimate of these costs. Fitch will apply the transaction costs presented in Appendix 7 only in the case of illiquid collateral where debt refinancing is less plausible (and reliance on a property sale is therefore greater).

Income Strips

In this section we refer to structures in which a tenant must keep paying rent in order not to lose valuable property. An example of an income strip would be where rent must be paid over a long-term period to secure unencumbered reversionary freehold value in a property at the end of the term. Compared to traditional ground rent obligations, in which the leaseholder has to pay the landlord a premium to extend the lease term, or is locked into perpetual ground rent payments, in this case the income strip is designed to create a strengthening incentive on the tenant to keep up with rent on the basis of the growing reward represented by the increasing present value of the asset.

These structures have become popular assets for insurance companies looking to match their long-dated liabilities. Below we describe the general approach to assessing the credit quality of income strips, noting that we may constrain the cash flow time horizon when assessing future property value for particularly long-dated liabilities. Please see Appendix 11 for more details on when this analysis applies or instead when that applicable to Credit-Linked Transactions does.

Fitch considers some of the characteristics of income strips as loan-like insofar as the tenant's incentive to honour rent obligations resembles a mortgage borrower's incentive to keep up with debt service – in both cases driven by the resilience of equity as a reward for performance. However, for income strips the incentive is considered greater because a failure to make rental payments exposes the tenant to a complete loss of value, a greater penalty than the loss of control over a charged property, and the imposition of additional costs that mortgage borrowers defaulting on loans face.

In rating non-indexed-linked income strips, Fitch quantifies the tenant's liability represented by its rental obligation over time by summing the remaining scheduled payments without discounting. For inflation index-linked obligations, Fitch may consider additional scenarios in which a non-zero (negative) discount rate is appropriate. Fitch recalculates this liability over time, alongside its estimate of stressed property value (accounting for the accumulating impact of building depreciation over time). Given prolonged exposure to depreciation, additional scenarios are tested to assess the sensitivity to steeper real depreciation assumptions.

Deducting the assumed lease liability from the asset value gives a measure of the tenant's equity position over time in different rating cases. Instead of adjusting down from break-even (as we do when rating conventional loans), Fitch rates the default probability of the income strip based on the highest rating case in which the tenant's equity, at any point in time, is sufficient to cover

the next ten years' worth of gross rental obligation (a shorter period may be considered for shorter risk horizons with for example newly-built properties or diversified portfolios). This additional coverage is designed to account for extended periods in which an asset may become negative income-producing (e.g. while undergoing redevelopment). This is also building in a cushion deemed sufficient to ensure any administrator of the tenant (assuming it defaults) includes rent in the priority liabilities it continues to service so as not to lose the equity. In contrast to loan ratings, income strip ratings are not capped in the 'A' category.

When analysing the ultimate recovery of the income strip in its cash flow analysis in rating cases higher than the timely payment rating, Fitch will also assess the adequacy over time of stressed, depreciating property income – here, on the basis of net effective rent, to account explicitly for tenant incentives and similar items that would otherwise be accounted for implicitly in the cap rate. Fitch will check which is the highest rating case in which this cash flow - potentially extending beyond the income strip maturity and increased by any residual land value, but carrying forward any payment shortfalls including penalty interest - can adequately cover the remaining rental obligations and allow for full recovery.

Loan Rating Caps

Loan ratings are capped at 'A+' if not fully amortising.

The types of loan- and property-level attributes that, for CMBS ratings, would cap loan proceeds at zero above 'A+' (as described in Appendix 4) are also applicable when rating loans and will apply to the "break-even" rating level, resulting in the loan rating being one to two categories lower.

For loans that face increased risk of interest payment interruption, owing either to extreme external conditions (e.g. pandemic) or intrinsic weakness (e.g. operational risk or lumpy leases), the exposure to the borrower's broad access to liquidity would cap the loan rating below investment grade – unless the borrower has committed liquidity or has arranged with the lender for voluntary payment forbearance.

For fully amortising loans, Fitch's ratings are determined in relation to the assumptions described elsewhere in this report. Only in these cases can loans be rated above the 'A' category.

Fitch makes considerations of loan default probability in rating some CMBS, for instance where external liquidity is constrained and/or the tail period is insufficient to consider giving full credit to mortgage enforcement; or for CMBS with significant scheduled principal over time that may exceed rental income. In applying these considerations, the 'A+' cap for loan ratings does not apply where there are sufficient CMBS structural features to diminish exposure to the deadline of loan maturity materially below that considered when rating a loan; or where we give credit to sponsor support of scheduled principal (by adjusting down one notch from the highest rating case in which interest is covered from rental income), but where this credit falls short of assuming sponsor support for full refinancing of the loan.

Performance Analytics

The performance analysis of transactions forms an essential part of Fitch's rating process. The approach to reviewing transactions is consistent with that taken when assigning new ratings.

Data Reporting

Fitch expects to receive cash manager, trustee and/or servicer reports in order to monitor the performance of each transaction's bonds and the underlying loans. For the majority of transactions, these reports are distributed on a quarterly basis, in line with the bond payment dates. The key data fields that the agency tracks are listed in Appendix 5.

In the course of its surveillance, Fitch may also request information in addition to that publicly reported. In particular, it may request an updated rent roll (typically from the servicer) or a data tape updated from the analysis carried out at closing and/or updated financials for non-lease operating assets. Fitch will adjust certain fields (e.g. ERV) where it considers that legacy data is stale.

Where information is limited, either because of low-quality reporting or because of the limited provision of information by the underlying borrowers, Fitch may use worst-case assumptions

when analysing a transaction. The agency also assesses if the periodic transaction reporting, as envisaged at closing, will be sufficient for it to monitor the underlying collateral. Should this not be the case, the agency will not assign a rating. Moreover, if reporting quality worsens after closing, Fitch may withdraw the ratings.

Reviews and Rating Actions

Fitch reviews the periodic data that it receives and compares it to previous periods' data, as well as its own expectations for the transaction. Subject to availability as described in Transaction Data Provided to Fitch, this review includes both quantitative and qualitative measures, as presented below.

- **Quantitative measures:** changes in relevant data (e.g. market value, occupancy rates, net operating income), either at portfolio-level or in one of the underlying loans, are monitored for potential materiality to ratings.

- **Qualitative measures:** servicer commentary (e.g. change in workout strategy) and related events (e.g. borrower progress in securing financing, amendments to documents) are monitored for potential materiality to ratings.

Where changes are judged as potentially material to ratings, the transaction will be reviewed and if appropriate rating action will be taken.

Fitch regularly monitors wider market conditions, including its rental and yield data, for changes that could affect its guidance assumptions. If a change is made to guidance assumptions, Fitch will consider the materiality to CMBS ratings, and review any affected transactions accordingly.

Regardless of transaction performance, Fitch takes rating actions on all its transactions under surveillance on at least an annual basis, in accordance with these criteria.

Limitations

Ratings, including Rating Watches and Outlooks, assigned by Fitch are subject to the limitations specified in Fitch's Ratings Definitions and available at https://www.fitchratings.com/site/definitions.

The base and stress scenarios defined within these criteria do not take into account the occurrence of losses incurred as a result of force majeure.

Appendix 1: Data Adequacy

Data Sources for Key Assumptions

Fitch uses investment property data from Cushman & Wakefield classified by market segment (combining geography and type). For certain market segments within the UK, rental and yield time series date back to 1980; for much of continental Europe, available historical data are more limited. Although the quality and breadth of available rental and yield data varies among the different jurisdictions, the longest time series available typically guides Fitch in forming its RVD and cap rate assumptions. (In certain market segments, however, particular periods may be set aside by Fitch as anomalous, e.g. pre-national unification data in certain German markets.)

The data that guide cap rate and RVD assumptions are based on prime quality collateral. In order to reflect the risks of weaker quality property, Fitch's SV assumptions are designed to be sensitive to: (a) market segment strength (six grades); and (b) property position-in-market/property grade (seven grades in total). For capital costs, Fitch has referred to academic research on historical average rates of rental depreciation observed for properties, segmented into standard types, to which capital expenditure has not been applied. Where applicable, Fitch models this cost as a cumulative depreciation factor over the life of the loan.

Data Sources for Key Hotel Assumptions

Fitch uses historical market segment data covering revenue per available room (RevPAR), occupancy and free cash flow (FCF) yields from various sources, including STR Global and Christie & Co. Current comparable gross operating profit (GOP) margin data is also available from sources such as Hotstats, which Fitch also uses.

If Fitch does not have access to these data for the markets in question, the agency will expect the arranger to procure it or similar. The use of historical hotel market data to derive rating assumptions follows the same approach as for other EMEA CRE markets, with a minimum requirement of 10 years for revenue data (in this case RevPAR), and more severe cap rates where less than 20 years of yield data is provided.

For non-rented hotels, the receipt of adequate hotel-by-hotel operating data is critical to Fitch's analysis of hotel FCF. The absence of certain key items (e.g. operating costs) may result in the adoption of broader and more conservative assumptions, or in some cases may prevent Fitch from rating the transaction. Fitch expects to receive detailed operating performance data covering an adequate period: the agency considers 36 months sufficient to capture any irregularities in reported operations; for shorter timeframes, Fitch makes more conservative adjustments to in-place revenue to minimise the risk of incorporating one-off windfalls.

Operating data will typically include a breakdown of individual revenue and cost items, management fees and contractual payments escrowed for fixtures, fittings and equipment (FF&E). If data is not broken down into detailed line items or is otherwise aggregated (which may apply for example, to leased hotels whose tenant is not obliged to report detailed operating performance to the landlord), Fitch will seek comparable data in the relevant market segment (e.g. from valuation reports or other research) to identify the appropriate range. If this can be identified, Fitch will make an assumption at the conservative end of the spectrum in its analysis. At a minimum, revenue data is necessary; the absence of important cost items may lead to rating caps or prevent a rating being assigned.

Fitch will use operating data to determine initial values for the various income and cost line items, based on recent performance (taking into account any exceptional factors such as any recent period of refurbishment when occupancy may have been artificially low, or the effect of one-off events that may have boosted performance).

In addition to reviewing historical performance metrics, Fitch will review all valuation reports, perform an on-site review of a sample of the hotels in the portfolio, and potentially also meet with the sponsor and/or operator. This research will enable Fitch to grade each hotel along two axes: resilience to new supply (graded "a" to "d"); and pricing power in a downturn (graded "A" to "D").

The information obtained from these sources may supplement Fitch's general understanding of the stickiness of various cost items in a downturn. This is relevant where costs are related to occupancy, in particular because Fitch assumes hotels with pricing power will manage occupancy down to defend average daily rate (ADR) during a downturn (see *Stressed Case in the Rating Approach* below).

For capital expenditure assumptions, Fitch reviews actual costs incurred on FF&E and on maintenance, in conjunction with minimum spends stipulated in the financing documentation. Where there is insufficient evidence, Fitch applies FF&E of no lower than 4% of total revenue, in line with typical ranges in valuation reports and other sources of information available to Fitch (including anecdotal evidence).

Appendix 2: RVD and Cap Rate Guidance Assumption Derivation in Decreasing/Stable Interest Rate Scenarios

The objective is to identify for each market segment a historical period whose combination of chronological rental evolution and point-in-time ending yield would, if repeated, represent the most severe value decline (MSVD) from the market's current Prime Value Basis (PVB). Therefore the MSVD is not a conventional measure of chronological market value decline or an actually observed value decline through the period in question. It is an expression of potential value decline (from PVB) associated with a rerun of a historical rental downturn, alongside a shift in prevailing yields up to the level recorded at the end of that downturn.

The PVB rebases the value of any representative prime asset in a given market by removing any overheating observed in prevailing market rents and yields, as we do in all our rating cases. This is carried out by capitalising the prevailing trend rent ("PVB Rent") at the higher of prevailing yield and 10Y average yield.

Fitch uses prime rent and prime yield time series data starting from March 2000 in order to calibrate guidance RVD and cap rate assumptions for each of the monitored market segments across its EMEA coverage. Starting from 2000 ensures the period under examination is consistent with Fitch's range for decreasing/stable interest rates, does not extend beyond the timeframe of significant prevailing geopolitical arrangements (e.g. German reunification, the formation of the eurozone) and is appropriately weighted to technological norms (e.g. the development of e-commerce, flexible workspaces).

The approach recognises the correlation between the two data streams (as yields reflect future rental expectations) and uses information from the two sources jointly in order to identify for each market segment a single historical scenario that informs its 'Asf' guidance assumptions. In doing so, a two-step process is set up consisting of:

1) identifying the MSVD-related historical period, by combining a rental-implied value decline (MVD-R) and a yield-implied value decline (MVD-Y).

2) utilising the information from this historical period to derive 'Asf' stresses.

For every market segment Fitch also measures any rental decline that has occurred in the last 18 months leading up to the most recent datapoint. An observed rental decline (ORD) is, in our view, a leading indicator of potential further disruption in market conditions, irrespective of historic performance. The ORD (floored at 0%, capped at 20%) is added to the minimum RVDs (see table to right) creating rating- and market segment-specific RVD Floors for the guidance RVD assumptions.

For markets whose 'Asf' guidance RVD assumption is equal to the 'Asf' RVD Floor (where the ORD is positive), we further floor our 'Asf' guidance cap rate at the historical peak yield observed since March 2000 ("Peak Yield"), to account for the potential of further disruption in market conditions.

This approach, which imposes minimum stresses based on real-time observations, is designed to inform our ratings with historic evidence, while also detecting those market segments undergoing a decline in rents capable of developing into a more severe downturn than any observed since 2000.

Fitch reviews its guidance assumptions regularly (typically when we receive new prime rent and yield information). Guidance assumptions for specific market segments may be determined in a manner that extends beyond the methods described herein to account for idiosyncratic/outlying market performance or additional information.

Identifying the Anchor Date

The Anchor Date is the starting date of the MSVD-related historical period described under 1 above.

In determining MVD-R, we observe chronological rental downturns since 2000 and measure cumulative percentage declines in rent (if positive) over any period no shorter than three years and no longer than seven years. Greater declines that have occurred outside of this range either

Minimum RVDs: (%)

|	
AAAsf	16
AAsf	12
Asf	8
BBBsf	6
BBsf	4
Bsf	2

Source: Fitch Ratings

were offset by subsequent rental rebound (within three years, a timeframe generally available in CMBS with typical tail periods) or assumed to be signs of a market undergoing structural disruption (greater than seven years) that are accounted for elsewhere in Fitch's criteria (structural vacancy, rating caps).

The MVD-Y component measures the market value effect implied by the "Terminal Yield" observation for each period (i.e. the yield at the end of each three-seven-year window) when compared with the market value implied by the higher of current yield and LTA. In contrast to the chronological nature of the MVD-R, MVD-Y is intentionally not path-dependent in order to reflect the possibility of investor sentiment abruptly reverting to historically-observed levels irrespectively of the prevailing investment conditions. Both MVD-R and MVD-Y are floored at 0%.

The MSVD is the sum of MVD-R and MVD-Y. Each data point in the dataset will be associated with 17 MSVD results, each one applying to a period from the date of that data point to each of the 17 quarters within the three-seven-year window, with the maximum selected as the relevant MSVD for that particular data point. We identify the data point with the highest MSVD across the whole dataset as the Anchor Date and, where applicable, use it to calibrate the 'Asf' guidance assumptions for that market segment. The MVD-R and MVD-Y applicable to the Anchor Date are referred to as Anchor MVD-R and Anchor MVD-Y, respectively.

Stylised Illustration of Anchor Date Identification

Example of market not driven by RVD Floor (dataset ending in Dec 21)
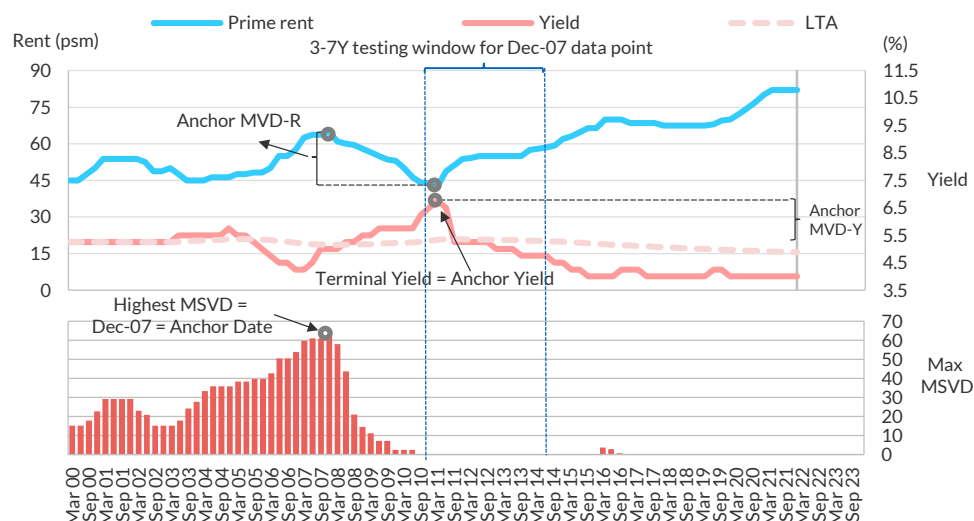
Source: Fitch Ratings

Guidance RVD Derivation

The RVD assumes ERV is permanently reduced by a factor, being both rating- and market segment-specific, comprising two components, both derived from historical rental time series data: (1) an adjustment to offset the prevailing point-in-cycle ("PiC adjustment"), i.e. bringing market rent down to PVB Rent, in line with a longer-term trend (the straight line that best fits the rental data); to which is added (2) the Anchor MVD-R (applied to PVB Rent). An RVD Floor may apply as explained below.

Applying Anchor MVD-R to PVB Rent has a conservative bias because markets with high Anchor MVD-R are likely to have overheated beyond their trend rent before any subsequent correction takes place. To moderate this bias, we identify markets with underlying Anchor MVD-R above 35% and, by recalculating the trendline to stop at the relevant Anchor Date (i.e., calculated between March 2000 and the Anchor Date), we deduct any excess of rent above that trend rent (as % of rent) from the underlying Anchor MVD-R. The result of this (floored at 35%) is the Anchor MVD-R referred to under (2) earlier in this paragraph for the purposes of deriving the guidance RVD for this subset of markets.

Stylised Illustration of RVD Derivation
Example of market not driven by RVD Floor
(RVD is derived by Prime rent and 'A' stressed rent)
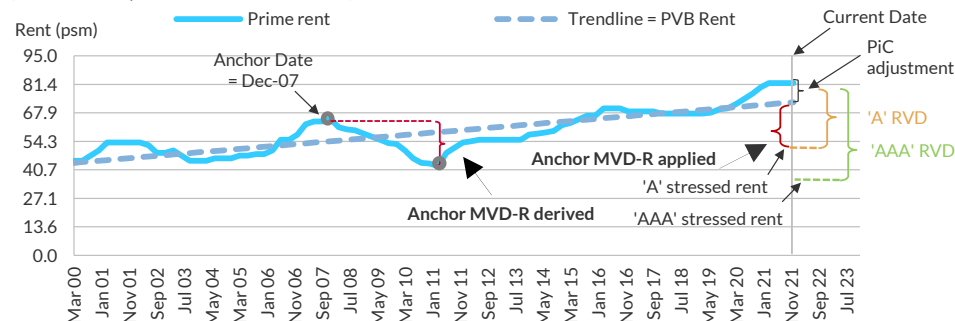
Source: Fitch Ratings

The "Anchor Rent" (A stressed rent in chart above derived by applying Anchor MVD-R to PVB Rent determines the 'Asf' RVD guidance assumption (subject to any RVD Floor as below) for that market segment. All other rating-specific stressed rent levels are derived by linear interpolation between trend rent and 'Asf' level (uncapped) and linear extrapolation from 'Asf' (uncapped) to 'AAAsf'. Any resulting guidance RVDs (subject to any RVD Floors as below) are capped at 80% to recognise the limitations of linear extrapolation.

Minimum RVDs and RVD Floors: Guidance RVD assumptions are positive and (apart from for PMRP and UK Student Housing portfolios described elsewhere), they are at minimum 2% for 'Bsf', 4% for 'BBsf', 6% for 'BBBsf', 8% for 'Asf', 12% for 'AAsf' and 16% for 'AAAsf' (the Minimum RVDs), in each case in addition to the ORD (between 0% and 20%) for the relevant market segment. The sum of the Minimum RVD and the ORD is the RVD Floor.

Stylised Illustration of RVD Derivation
Example of market driven by RVD Floor
(RVD is derived by Prime rent and 'A' stressed rent)
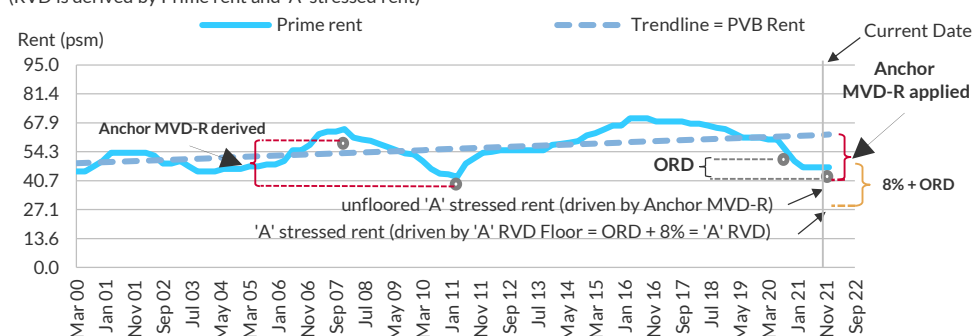
Source: Fitch Ratings

Guidance RVD by Rating Level (RevPARD in the Case of Hotels, Excluding PMRP and UK Student Housing)
Illustration of Stressed Rent Derivation, RVD Floors and RVD cap

Rating case	Stressed Rent Derivation[a]	Further stressed rent considerations		
		Minimum RVD (%)	RVD Floor (%)	RVD cap (%)
AAA	Extrapolate	16	16 + ORD	80
AA	Extrapolate	12	12 + ORD	80
A	Anchor Rent	8	8 + ORD	80
BBB	Interpolate	6	6 + ORD	80
BB	Interpolate	4	4 + ORD	80
B	Trendline = PVB Rent	2	2 + ORD	80

[a] Stressed rent is afterwards capped at the prevailing prime rent for all ratings – please see formula below
Source: Fitch Ratings

The guidance RVDs reflect reductions from prevailing prime rent and are derived using the following formula:

Rating-specific RVD = min (80%, max (1 – min (Stressed Rent, prevailing prime rent)/prevailing prime rent, RVD Floor))

Guidance Cap Rate Derivation

The 'Bsf' cap rate is set equal to the higher of prevailing yield and 10Y average. The 'Asf' cap rate is equal to the terminal yield ("Anchor Yield") informing the Anchor MVD-Y, subject to a floor equal to 1.05x 'Bsf' cap rate. For markets whose 'Asf' guidance RVD assumption is equal to the 'Asf' RVD Floor and whose ORD is positive, the Peak Yield acts as a further floor to the 'Asf' cap rate.

The 'AAAsf' cap rate is set at 1.1x 'Asf' cap rate, preserving some buffer in excess of the historical scenario that calibrates the 'Asf' guidance stresses. All other cap rates are derived by using equal ratio interpolation between 'AAAsf' and 'Asf'; and again between 'Asf' and 'Bsf'.

Guidance Cap Rate Assumptions Calculation – Anchor Yield vs Peak Yield
Is guidance 'Asf' RVD = 'Asf' RVD Floor (where ORD >0%)?

Rating case	If "No"	If "Yes"
AAA	1.1x 'Asf' cap rate	1.1x 'Asf' cap rate
AA	Interpolate	Interpolate
A	Max (**Anchor Yield**, 1.05x 'Bsf' cap rate)	Max (**Peak Yield**, 1.05x 'Bsf' cap rate)
BBB	Interpolate	Interpolate
BB	Interpolate	Interpolate
B	Max (Current yield, 10Y average)	Max (Current yield, 10Y average)

Source: Fitch Ratings

Example 1: Market Whose RVD Floor Does not Calibrate Any Guidance Assumptions

Stylised Illustration of Anchor Date Identification

Example of market not driven by RVD Floor (dataset ending in Dec 21)
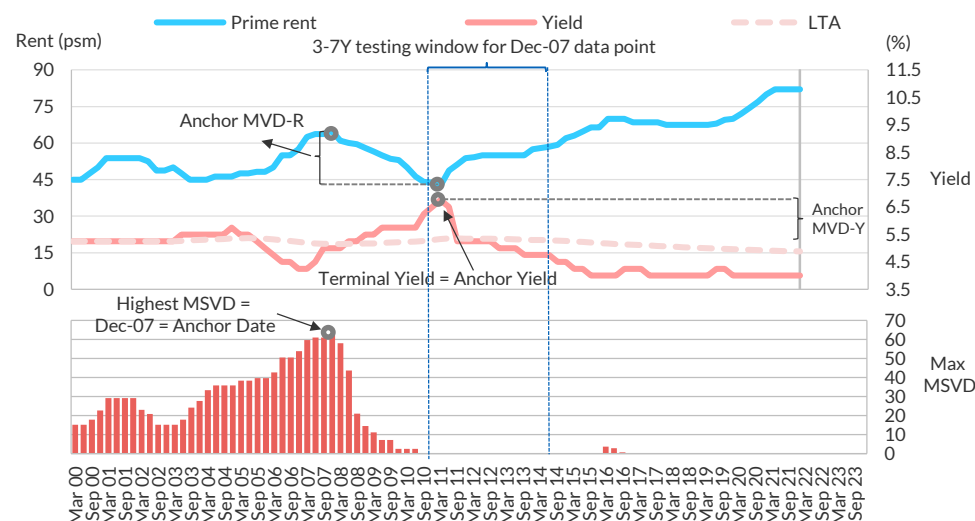
Source: Fitch Ratings

The maximum MSVD for the data point in June 2005 is 38.3% (max of the 17 MSVD results) with "Mar-11" being the quarter of the highest MSVD. The MVD-Ys have been computed using the max of the current prime yield and LTA numbers from the table below. The June 2005 data point has Terminal Yield equal to 6.75% and MVD-R equal to 10.5%.

This process is repeated for all the points in the dataset to identify "Dec-07" as the Anchor Date, when the MSVD is at its highest, with specifics as illustrated below.

Example 1: Identifying the Anchor Date – Example of Random Point (Jun 05 – Prime Rent = 47.5)

Quarters	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Date	Jun 08	Sep 08	Dec 08	Mar 09	Jun 09	Sep 09	Dec 09	Mar 10	Jun 10	Sep 10	Dec 10	Mar 11	Jun 11	Sep 11	Dec 11	Mar 12	Jun 12
Prime Rent	60.0	59.5	58.0	56.5	55.0	53.5	53.0	50.0	46.3	44.0	43.8	42.5	48.8	51.3	53.8	54.3	55.0
Yield (%)	5.25	5.25	5.50	5.50	5.75	5.75	5.75	5.75	5.75	6.25	6.50	6.75	6.50	5.25	5.25	5.25	5.25
MVD-R (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	7.4	7.9	10.5	0.0	0.0	0.0	0.0	0.0
MVD-Y (%)	7.1	7.1	11.3	11.3	15.2	15.2	15.2	15.2	15.2	22.0	25.0	27.7	25.0	7.1	7.1	7.1	7.1
MSVD (%)	7.1	7.1	11.3	11.3	15.2	15.2	15.2	15.2	17.8	29.3	32.9	38.3	25.0	7.1	7.1	7.1	7.1

Source: Fitch Ratings

Example 1: Data Table

Anchor Date	Dec 07
Prime Rent on Anchor Date (a)	65.0
Tested window	Dec 10 to Dec 14
Quarter of highest MSVD	Mar 11
Prime Rent in quarter of highest MSVD (b)	42.5
Prevailing Prime Rent (c)	82.0
Trendline Rent = PVB Rent (d)	72.9
ORD (capped at 20%, floored at 0%) (e)	0.00%
Current Prime Yield (f)	4.00%
LTA yield (g)	4.88%
10Y average yield (h)	4.31%
Peak Yield (hh)	6.75%
Terminal Yield = Anchor Yield (j)	6.75%
MVD-R (k)	**34.6%**
MVD-Y (l)	**27.7%**
Highest MSVD (m)	**62.4%**

Source: Fitch Ratings

Deriving the stresses	
'B' stressed rent (n)	72.9
'B' RVD (o)	11.1%
'BBB' stressed rent (p)	56.1
'BBB' RVD (q)	31.6%
'A' stressed rent (r)	47.7
'A' RVD (s)	41.9%
'AA' stressed rent (t)	39.3
'AA' RVD (u)	52.1%
'AAA' stressed rent (v)	30.9
'AAA' RVD (w)	62.4%
'B' cap rate (x)	4.31%
'BBB' cap rate (y)	5.81%
'A' cap rate (z)	6.75%
'AAA' cap rate (aa)	7.43%

Source: Fitch Ratings

Applied Guidance RVDs (%)	AAA	AA	A	BBB	BB	B
RVD Floor	16.0	12.0	8.0	6.0	4.0	2.0
RVD[a]	62.4	52.1	41.9	31.6	21.3	11.1
Cap Rate	7.43	7.08	6.75	5.81	5.01	4.31

[a] All RVDs are capped at 80% and floored at the RVD Floor
Source: Fitch Ratings

Example 2: Market Whose RVD Floor Calibrates Some Guidance Assumptions

In this Example 2, rental declines and yield increases after June 2018 indicate market conditions are deteriorating as opposed to improving conditions shown in Example 1.

Example of Market Driven by RVD Floor (Latest Data Point in Dec 21)
(For the avoidance of doubt the Anchor Yield does not always equal the Peak Yield)

Source: Fitch Ratings
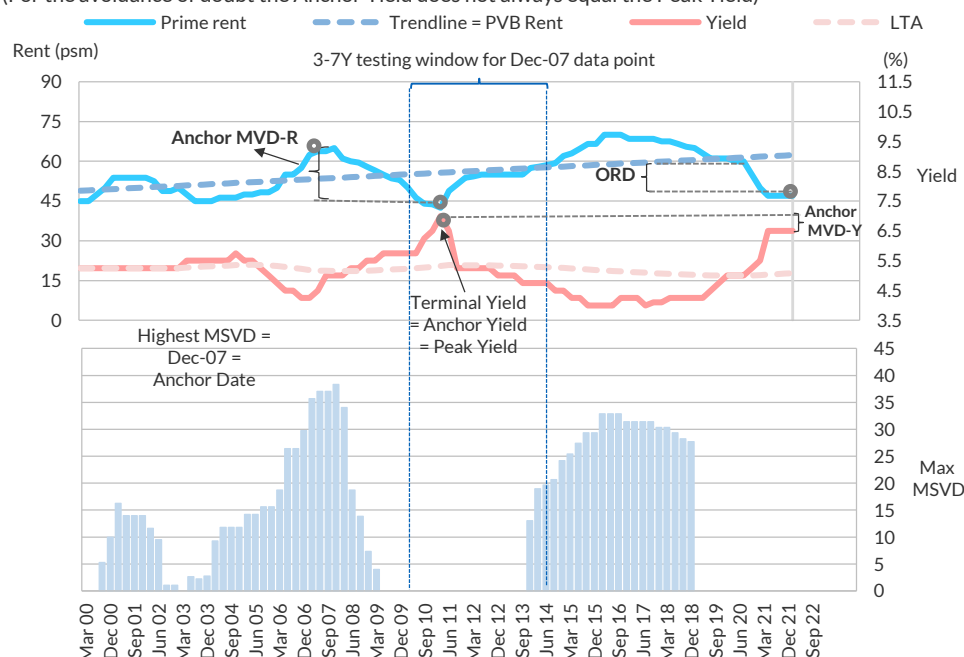
The highest MSVD in Example 2 is lower than in Example 1 because yields have already risen closer to the Anchor Yield.

Example 2: Data Table

Anchor Date	Dec 07
Prime Rent on Anchor Date (a)	65.0
Tested window	Dec 10 to Dec 14
Quarter of highest MSVD	Mar 11
Prime Rent in quarter of highest MSVD (b)	42.5
Prevailing Prime Rent (c)	47.0
Trendline Rent = PVB Rent (d)	62.3
ORD (floored at 0% and capped at 20% afterwards) (e)	21.7%
Current Prime Yield (f)	6.50%
LTA yield (g)	5.08%
10Y yield average (h)	4.76%
Peak Yield (hh)	7.00%
Terminal Yield = Anchor Yield (j)	7.00%
MVD-R (k)	**34.6%**
MVD-Y (l)	**7.2%**
Highest MSVD (m)	**41.8%**

Source: Fitch Ratings

Deriving the stresses	
'B' stressed rent (n)	62.3
'B' RVD (o)	22.0%
'BBB' stressed rent (p)	48.0
'BBB' RVD (q)	26.0%
'A' stressed rent (r)	40.8
'A' RVD (s)	28.0%
'AA' stressed rent (t)	33.6
'AA' RVD (u)	32.0%
'AAA' stressed rent (v)	26.4
'AAA' RVD (w)	43.9%
'B' cap rate (x)	6.50%
'BBB' cap rate (y)	6.83%
'A' cap rate (z)	7.00%
'AAA' cap rate (aa)	7.70%

Source: Fitch Ratings

Applied Guidance RVDs (%)	AAA	AA	A	BBB	BB	B
RVD Floor	36.0	32.0	28.0	26.0	24.0	22.0
RVD[a]	43.9	32.0	28.0	26.0	24.0	22.0
Cap Rate	7.70	7.34	7.00	6.83	6.66	6.50

[a] All RVDs are capped at 80% and floored at the RVD Floor
Source: Fitch Ratings

Formulaic Expression of Guidance Assumption Building Blocks (RVDs are further capped at 80%)

Table of Formulas	If (and {s=8%+e, e>0}) = FALSE	If (and {s=8%+e, e>0}) = TRUE
MVD-R	$k = \max(1-b/a, 0\%)$	$k = \max(1-b/a, 0\%)$
MVD-Y	$l = \max(1-\{(1/j)/[1/\max(f, g)]\}, 0\%)$	$l = \max(1-\{(1/j)/[1/\max(f, g)]\}, 0\%)$
Max MSVD	$m = k + l$	$m = k + l$
'Bsf' stressed rent	$n = \min(c, d)$	$n = \min(c, d)$
'Bsf' RVD	$o = \max(1-n/c, 2\%+e)$	$o = \max(1-n/c, 2\%+e)$
'BBBsf' stressed rent	$p = \min(c, ab + (d-ab)/3$ *(interpolation)*	$p = \min(c, ab + (d-ab)/3$ *(interpolation)*
'BBBsf' RVD	$q = \max(1-p/c, 6\%+e)$	$q = \max(1-p/c, 6\%+e)$
'Asf' stressed rent	$r = \min(c, ab)$	$r = \min(c, ab)$
'Asf' RVD	$s = \max(1-r/c, 8\%+e)$	$s = \max(1-r/c, 8\%+e)$
'AAsf' stressed rent	$t = \min(c, ab - (d-ab)/3$ *(extrapolation)*	$t = \min(c, ab - (d-ab)/3$ *(extrapolation)*
'AAsf' RVD	$u = \max(1-t/c, 12\%+e)$	$u = \max(1-t/c, 12\%+e)$
'AAAsf' stressed rent	$v = \min(c, t - (d-ab)/3$ *(extrapolation)*	$v = \min(c, t - (d-ab)/3$ *(extrapolation)*
'AAAsf' RVD	$w = \max(1-v/c, 16\%+e)$	$w = \max(1-v/c, 16\%+e)$
'Bsf' cap rate	$x = \max(f, h)$	$x = \max(f, h)$
'BBBsf' cap rate	$y = x * \{(z/x) \wedge (1/3)\} \wedge 2$ *(interpolation)*	$y = x * \{(z/x)) \wedge (1/3)\} \wedge 2$ *(interpolation)*
'Asf' cap rate	$\underline{z = \max(j, 1.05*x)}$	$\underline{z = \max(hh, 1.05*x)}$
'AAAsf' cap rate	$aa = 1.1*z$	$aa = 1.1*z$
Anchor Rent	$ab = d*(1-k)$	$ab = d*(1-k)$

Source: Fitch Ratings

Adjustments for Limited Time Series Data

Fitch does not maintain customised guidance RVD or cap rate assumptions for market segments with less than 10 years' rental or yield time series data. Instead, Fitch may proxy those market segments with others considered similar based on geographical proximity and social/economical resemblance.

Appendix 3: Rating Assumption Sensitivity

The ratings assigned to CMBS transactions by Fitch are mainly sensitive to: (i) the CRE assumptions underlying the property-level analysis; and (ii) interest rate scenarios. The agency will indicate in its presale or new issue reports the model-implied rating actions for all classes of notes from hypothetical changes in the values of predefined variables.

Model-Implied Sensitivity

The MIR sensitivities based on such assumptions are only indicative of some potential outcomes and do not consider other risk factors to which the transaction is exposed. For these purposes, Fitch will perform sensitivity analysis on MIR, and quantify the relative impact on the results under shifts in various factors. This relative impact, in terms of the number of rating notches, will be displayed as an adjustment to the actual ratings, to preserve any deviation from MIR (not caused by direct rating caps).

As far as the CRE analysis is concerned, increases in the assumed structural vacancy and capitalisation rates and a reduction in ERV (while not offset by lower RVDs) all have a negative effect on projected cash flows and stressed property values. For these, reasons, Fitch tests ratings sensitivity to shifts in one or a multiple of these factors, as shown in the examples below.

Rating Sensitivity Examples to Shifts in One Factor

Rating Sensitivity to Higher Cap Rates (Results are Illustrative)

Scenario	Class A	Class B	Class C
Original ratings	AAAsf	Asf	BBBsf
Cap rates higher by 1pp	AAAsf	BBB+sf	BB+sf
Cap rates higher by 2pp	AA+	BBB-	BB

Source: Fitch Ratings

Rating Sensitivity to Higher RVDs (Results are Illustrative)

Scenario	Class A	Class B	Class C
Original ratings	AAAsf	Asf	BBBsf
RVDs higher by 15pp	AA+sf	BBB-sf	BB-sf
RVDs higher by 30pp	AA-	BB	B

Source: Fitch Ratings

Rating Sensitivity to both Higher Cap Rates and RVDs (Results are Illustrative)

Scenario	Class A	Class B	Class C
Original ratings	AAAsf	Asf	BBBsf
Cap rates higher by 1pp and RVDs higher by 15pp	AAsf	BB+sf	Bsf
Cap rates higher by 2pp and RVDs higher by 30pp	A	B+	CCC

Source: Fitch Ratings

Appendix 4: Rating Caps in EMEA CMBS

Unless suitably mitigated, the following characteristics are not consistent with ratings in the 'AAsf' category or higher; where several characteristics apply, or for serious shortcomings, Fitch may decline to assign a rating.

- Real estate refinance risk-concentrated exposure to property with few alternative uses:

  - "operating assets" such as gyms, bingo halls, cinemas;

  - properties with:

    - regulatory or planning restrictions without broad occupational demand, e.g. large exposures to UK purpose-built student accommodation in a small university town, essential infrastructure;

    - bespoke physical configuration or technical specialisation;

  - at risk of obsolescence on grounds of geographic/economic uncertainty, e.g. located outside core urban markets:

  - with high cost base, e.g.:

    - assets in need of significant redevelopment/capital expenditure after contracted income expires;

    - assets with high operating leverage (e.g. high ground rents);

  - with poor prospects of sustained income-generation, i.e. poor-quality assets, with:

    - limited track record of occupancy;

    - weak income visibility after loan maturity (e.g. lease and loan terms coincide for poor quality assets);

    - high current vacancy, little committed income or excessive single-name exposure to weak tenants;

  - in weak/untested markets;

  - no, or limited, historical rental, yield and/or cost data available for the relevant (sub)market and property type;

  - no, or limited, performance data (in case of operational assets) available for the relevant (sub)market and property type;

  - at risk of potentially unquantifiable liabilities (e.g. environmental clean-up costs not sized for in technical reports);

  - contributing a significant share of collateral value without being prime quality.

Some of these real estate refinance risks can be mitigated by scheduled loan amortisation that is sufficient and affordable; or by appropriate property diversity, provided sufficient principal is allocated in a sequential manner and release pricing is effective.

- Data risk – required fields are incomplete or data are believed to be unreliable.

- Borrower/sponsor risk.

  - Little evidence of commitment to the loan from sponsor, e.g.:

    - insufficient/negative equity;

    - incoherent portfolio strategy, short record or unclear background/ corporate history;

  - Insufficient limitations on permitted activities may introduce:

    - potentially unquantifiable costs (e.g. personnel costs; tax claims);

    - insolvency risk with a stay on enforcement.

Some of these borrower/sponsor risks can be mitigated by scheduled loan amortisation that is sufficient and affordable; by appropriate borrower diversity, provided sufficient principal is allocated in a sequential manner; or, for existing deals, by a strong track record and performance.

- Structural risk

  - Servicer/operational risk:

    - no servicer or similar agent;

    - inadequate servicing competence or resourcing;

    - no planning for possible transfer of servicing for granular loan pools;

    - infrequent or insufficiently controlled property revaluations;

    - servicing poorly set up or conflicted given commercial pressures or incentives, e.g.:

      - servicer has a potentially conflicted duty of care;

      - power to replace servicer inappropriately vested, e.g. in out-of-the-money investors;

      - servicer fees, holdings, or ownership structure favour some actions (or inaction) over others;

    - overreliance on sponsor, e.g.:

      - day-to-day property management not fungible, impeding potential transfer of control to servicer;

        - duties overly complex and poorly documented;

        - transfer of information and expertise not anticipated by loan agreement;

      - essential capex programme funded by sponsor;

      - material flexibility in property substitution/releasing collateral/raising pari passu debt;

  - recovery process:

    - original tail period less than five years without suitable mitigants;

    - remaining tail period offers insufficient additional headroom in jurisdictions where required legal recovery process is particularly lengthy or unclear (e.g. France);

    - loans secured on real estate within jurisdictions (e.g. southern Italy) where mortgage enforcement may be highly protracted, unless mitigated, e.g. where the CMBS offers a tail period considerably in excess of seven years or where sustainable FCFs are sufficient to redeem the relevant debt in a short timeframe. If the tail period is below seven years, Fitch does not expect to give any credit to mortgage recoveries at investment-grade ratings in such cases.

    - liquidity support for tranche in question insufficient to ensure timely payments in relevant stress;

    - security package incomplete or potentially defective;

    - pay-down rules potentially altering the credit risk exposure to a portfolio (e.g. pro-rata allocation of final recovery proceeds or defective sequential triggers);

- unquantifiable costs, e.g.:

  ◆ senior break costs connected to long-dated hedges;

  ◆ unhedged foreign-exchange risk, including senior break costs;

  ◆ those resulting from ambiguous or otherwise weak legal documentation e.g.:

    • where the risk of spikes in costs (such as liquidation fees) falling onto the issuer is not adequately proscribed and could lead to missed interest on the senior notes;

    • where loan default sequential pay triggers do not pick up loan extensions negotiated at or around loan maturity (this would not include scheduled loan extension options);

- counterparty risk:

  ◆ non-compliance with structured finance counterparty criteria for material risk exposure above the rating of the counterparty.

Some of these structural risks can be mitigated by low whole loan leverage (at exit), where this implies a very high probability of borrower refinancing.

Appendix 5: Data List

The tables below list data fields that Fitch uses in its analysis of European CMBS transactions. The lists are not intended to be exhaustive and only include key data fields; Fitch's full data templates are available upon request. Fitch may also request additional information where necessary.

Analysis of New Transactions – Commercial Assets

Data Fields – New Transactions (Commercial Assets)

Borrower information
Year of incorporation
Borrower type
Contingent liabilities
Loan information
Governing law
Whole loan balance
Securitised loan balance
Maturity date (original and extended, if applicable)
Participation (%)
A/B note classification
Debt service allocation prior to default
Debt service allocation post default
Interest rate information
Loan hedging information
Reported ICR/DSCR
Reported LTV
Performance triggers (cash trap triggers, cash sweep triggers)
Loan covenants (LTV, ICR)
Amortisation schedule
Property information
Property type (residential, retail, office, industrial, mixed residential/office, mixed retail/office, hotel, land, other)
Property location (region, postcode)
Reported property level irrecoverable costs
Property valuation information (valuation date, valuer, market value, vacant possession value)
Reported net initial yield
Reported equivalent yield
Reported reversionary yield
Property sundry cash flows information
Tenant information
Tenant name
Fitch long-term rating
Other ratings
Commercial unit information
Unit type
Tenant name
Gross passing rent
Unit ERV
Floor area
Lease type (gross, triple net, double net)
Lease information (lease start date, break date, expiry date)

Source: Fitch Ratings

Analysis of New Transactions – PMR

Data Fields – New Transactions

Number of units
Surface areas
In-place rent
Gross potential rent (i.e. assuming full occupancy)
Market rent
Irrecoverable expenses
Subsidies (if any)
Source: Fitch Ratings

Data should be provided either on an aggregated basis for the entire portfolio or, in the case of larger portfolios, by property clusters. All data should be further broken down by residential area (and further into subsidised and non-subsidised space, for German portfolios), commercial area and parking/garage space. To determine the sustainability of the current income and cost levels, the agency expects to receive both historical and projected financial information.

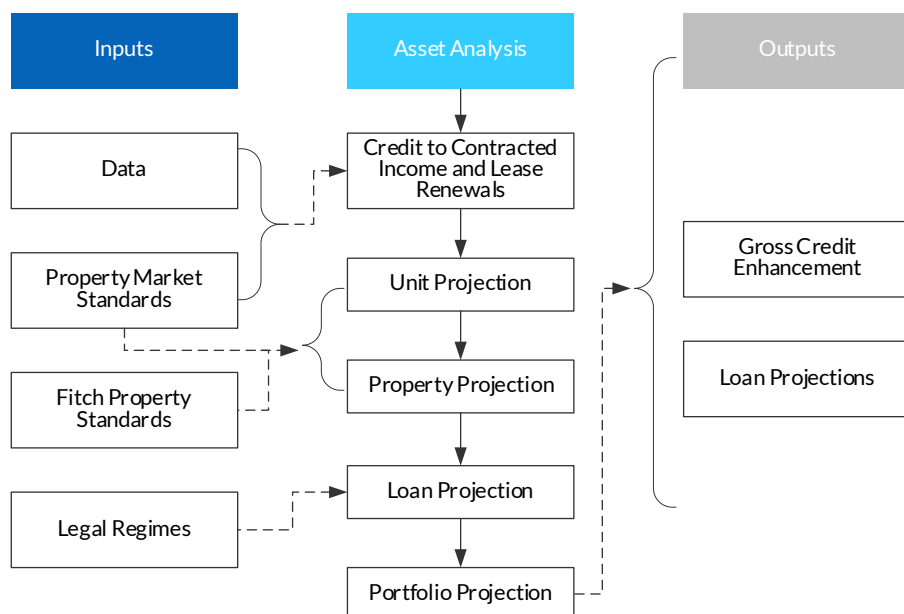**Analysis of Existing Transactions (where it differs from New Transactions above)**

Data Fields – Existing Transactions

Tranche information
Interest distributions (including shortfalls, if any)
Principal distributions
Allocated losses/non-accrued interest amounts
Portfolio information
Delinquencies/foreclosures/defaults/loss (granular portfolios only)
Liquidity facility: Available balance, drawings, repayments
Loan information (non-granular portfolios)
Outstanding balance (including senior-ranking debt, B-notes and/or mezzanine debt, if any)
WA lease term
Net operating income
Lettable area
Loan status: Covenant breaches, payment defaults, missed balloon payments etc
Loan default date (if applicable)
Special servicing transfer date (if applicable)
Counterparty information
Name and type of transaction counterparty (liquidity facility, swap provider, account bank)
Current rating of counterparty/counterparty criteria rating trigger
Collateral posting
Name of bank with which collateral has been posted/guarantee provided
Fitch rating of bank in which collateral has been posted/guarantee provided
Collateral calculation
Amount of collateral posted/guaranteed amount
Source: Fitch Ratings

The above list does not include fields that Fitch may calculate if they are not already provided (e.g. advance rates). In addition, the loan-level commentary that is presented in conjunction with performance figures (or separately, as special notices) is often the most valuable component of the investor reporting package. This is especially the case where loans are underperforming, as it provides additional detail on actions that are being taken by the relevant servicer/special servicer and allows Fitch to form a view on the likely outcomes of such actions and their impact on the ratings.
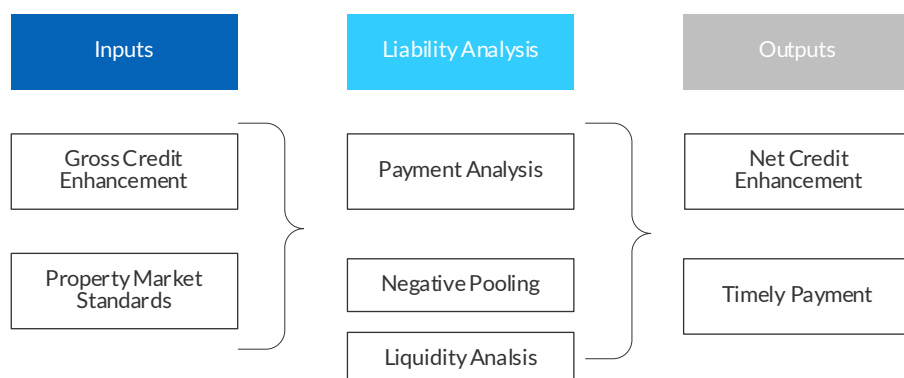
Appendix 6: Analytical Workflow

Analytical Workflow – Asset Analysis

Inputs	Asset Analysis	Outputs
Data	Credit to Contracted Income and Lease Renewals	Gross Credit Enhancement
Property Market Standards	Unit Projection	Loan Projections
Fitch Property Standards	Property Projection	
Legal Regimes	Loan Projection	
	Portfolio Projection	

Source: Fitch Ratings

Analytical Workflow – Liability Analysis

Inputs	Liability Analysis	Outputs
Gross Credit Enhancement	Payment Analysis	Net Credit Enhancement
Property Market Standards	Negative Pooling	Timely Payment
	Liquidity Analsis	

Source: Fitch Ratings

Appendix 6 replicates the chronology of Fitch's asset and liability analysis: starting with data and collateral assessment to calculate gross CE, before proceeding to net CE results, after completing portfolio adjustments and CMBS liability analysis.

Appendix 7: Guidance for Sale/Enforcement in CRE Market Sectors

When calculating collateral liquidation proceeds in developed European economies, Fitch deducts acquisition costs of 6% (or 0% in markets where applied cap rates are gross of acquisition costs) and selling costs of 2.5%. Where liquidation is enforced in developed European economies, Fitch deducts additional foreclosure costs of 2% and assumes recovery proceeds flow after a lag of 36 months from loan payment default.

Sales/Enforcement Guidance Assumptions

	Acquisition costs (%)	Selling costs (%)	Foreclosure costs (%)	Recovery period (months)
Developed European Countries	6.0[a]	2.5	2.0	36

[a] For markets where prime yields from C&W are quoted (and cap rates applied) gross of acquisition costs (e.g. in Austria, Belgium, the Netherlands, Italy, Poland, Portugal), these purchaser-pays costs are set to 0%
Source: Fitch Ratings

Should Fitch apply these criteria to loans it considers would be subject to higher costs and/or recovery timing, Fitch will apply assumptions in excess of this guidance. This may apply to loan financing structures or collateral arrangements Fitch views as particularly complex, or in jurisdictions where available evidence or local practitioners' expert opinions suggest more conservative assumptions should apply. Where Fitch has already identified a jurisdiction that warrants a more conservative assumption, it is listed in the table below.

Conversely, in its research Fitch has identified a small number of jurisdictions that warrant less-conservative assumptions for costs and/or recovery timing; such jurisdictions are also all listed in the table below.

Jurisdictions with Bespoke Guidance Assumptions

	Acquisition costs (%)	Selling costs (%)	Foreclosure costs (%)	Recovery period (months)
Germany	6.0	1.0	2.0	36
Ireland	7.5	2.5	2.0	30
Italy	0.0	2.5	2.0	36–60[a]
Poland	0.0	2.0	2.0	36
Portugal	0.0	3.5	2.0	36
Spain	6.0	2.5	2.0	48
UK	5.0	1.75	2.0	24

[a] 36 months for properties located in the north of Italy, or multi-property portfolios; 60 months for properties in the south of Italy.
Source: Fitch Ratings

Appendix 8: Glossary of Terms

Terminology Used in the Report

Cap rate	The ratio of average projected asset income to its estimated market value.
Rental yield	The ratio of rental income to asset value.
Initial yield	The ratio of current rental income to asset value.
Reversionary yield	The ratio of potential rental income if let at the estimated market rent to asset value. A property is over-rented if current rent is above market rent and under-rented if below market rent.
Equivalent yield	An average of initial and reversionary yields
Prime yield	The yield for above-average quality assets.
Debt yield	The ratio of rental income to loan balance.
Rent roll	Unit-level tenancy data.
Loan waterfall	Priority of payments, as defined under the loan agreement.
ICR	Ratio of in-place rent to loan interest payable.
DSCR	Ratio of in-place rent to the sum of loan interest and principal payable.
Balloon risk	Risk related to the repayment of the loan amount outstanding at loan maturity or upon loan default.
MIR	Model-implied rating
MSVD	Most-severe value decline
Max MSVD	The maximum MSVD associated with the 17 MSVD results for each of the quarterly data points
Highest MSVD	The highest MSVD across the quarterly data points informing the Anchor MVD-R and the Anchor MVD-Y
MVD-R	The rent component of any MSVD result
MVD-Y	The yield component of any MSVD result
Anchor MVD-R	The MVD-R applicable to the Anchor Date
Anchor MVD-Y	The MVD-Y applicable to the Anchor Date
PVB	Prime value basis – derived as the ratio of PVB Rent over the higher of current prime yield and 10Y average yield
PVB Rent	Prime value basis rent – equal to current trend rent
ORD	Observed rental decline – the decline observed in prime rents over the last 18 months
PiC Adjustment	Point-in-cycle adjustment – the adjustment that brings current prime rent down to PVB Rent
Anchor Date	The quarter associated with the highest MSVD
Anchor Rent	The rent derived by applying the Anchor MVD-R to PVB Rent
Anchor Yield	The yield informing the Anchor MVD-Y
Terminal Yield	The yield at the end of any window within the 3-7Y window
Peak Yield	The maximum prime yield since March 2000
LTA Yield	Long term average yield – the average prime yield since March 2000
'Bsf' cap rate	The cap rate relevant to a 'Bsf' rating case - calculated as the higher of current prime yield and 10Y average yield

Source: Fitch Ratings

Appendix 9: Liquidity Tests

Liquidity testing is a potential rating constraint on results produced elsewhere in the rating analysis. Besides matters covered in the *Structured Finance and Covered Bonds Counterparty Rating Criteria*, a loan default can mean issuer collections are insufficient to permit payment frequency commensurate with a particular note rating. Therefore, the starting point of Fitch's liquidity analysis is the EMEA CMBS Asset Model responsible for producing the MIR (assuming RVDs consistent with stable/decreasing interest rate scenarios), which allows Fitch to identify the relevant loan-level cash flows for a given rating.

In some cases, Fitch may consider additional cash flow scenarios that go beyond the MIR settings e.g. where property disposals, material lease features (e.g. long rent-free), legal or borrower risks (e.g. suspension of payments during insolvency) or other events (e.g. tenant default, enforced business closures during a pandemic) could fundamentally reduce stressed loan debt yields, or where the notes are rated for timely principal. For CMBS to which none of the above additional cash flow scenarios apply, the liquidity analysis described below is performed only when at least one loan is projected to miss interest in the relevant rating cases.

Fitch approaches liquidity risk, note class by note class, via a series of tests becoming progressively more detailed and therefore more precise. Where a note class satisfies a particular test, this obviates any need to run further tests along this series, and the note class in question is considered to be able to meet its payment obligations commensurate with its rating. Conversely, where a test is not satisfied, rather than re-run it with a lower rating, Fitch instead moves along the series of tests stopping only if a test is satisfied. If no test is satisfied, the rating will be constrained as applicable.

Screening Tests for Timely-Pay

"Timely-pay notes" are notes that are already senior and non-deferrable, notes that can become senior and non-deferrable during their life and/or notes in whose putative rating case timely payment is required by the *Global Structured Finance Rating Criteria* (the latter referred to hereafter as "timely-pay-rating notes").

Fitch tests whether eligible external liquidity would be sufficient to cover shortfalls of interest (and, if scheduled, principal) on the timely-pay notes, primarily caused by loan underperformance.

1) Test 1. This applies to transactions without extraordinary property attributes, e.g. highly concentrated tenant base, long unexpired rent-free periods etc, that could cause cash flow disruption. For applicable transactions, Fitch will consider any note whose interest is eligible for external liquidity support to have satisfied the minimum conditions for timely interest commensurate with Fitch's Global Structured Finance Rating Criteria, provided the available external liquidity exceeds 1.5x the issuer's annual liability for items eligible for liquidity support. For floating-rate CMBS, the test uses Fitch's relevant high interest rate plateau, subject to the less effective of any eligible borrower or issuer hedging or any note cap in the tail period.

2) Test 2. For timely-pay notes failing or ineligible for test 1, for the relevant rating cases Fitch compares (A) the lowest loan debt yield (measured as stressed income at loan default after deducting assumed senior expenses, including special servicing fees, over the current loan balance) with (B) the note "effective coupon".

   The note "effective coupon" is:

   - In testing junior timely-pay-rating notes: the note interest due on that tranche and the tranches above it calculated as the relevant high interest rate plateau plus the relevant margins (or for any note subject to an AFC, the highest loan margin (provided this is lower)), divided by the balance of the notes outstanding.

   - For all notes: the note interest due on that tranche calculated as the relevant high interest rate plateau plus its margin (or for any note subject to an AFC, the highest loan margin (provided this is lower)), divided by the sum of the current balance of that tranche and the ones junior to it.

Apart from those issued by multi-loan CMBS that allow for reverse sequential pay (which would require a customised liquidity analysis), any timely-pay note where (A) exceeds (B) is considered to have satisfied the minimum conditions for timely interest commensurate with Fitch's Global Structured Finance Rating Criteria.

3) Test 3. It applies to timely-pay notes failing test 2 (other than notes issued by single-loan CMBS or that are the most junior tranche (for which a failure of test 2 cannot be corrected by applying test 3)):

Pro Rata Paydown

- Timely-pay notes (currently senior): Those notes that are issued by pro rata CMBS do not meet the minimum conditions for timely interest without performing a more detailed liquidity analysis as explained in the Fully specified tests section below.

- Timely-pay notes (not currently senior): For those notes that are issued by pro rata CMBS, Fitch will rank loans in order of stressed debt yield and calculate (C) the lowest WA stressed debt yield corresponding to an aggregate loan balance equal to the sum of the current balance of that tranche and the ones junior to it. Any note where (C) exceeds (B) is considered to have satisfied the minimum conditions for timely interest commensurate with Fitch's Global Structured Finance Rating Criteria, with the possible exception of lumpy pools with bar-belled debt yield profiles or where there is strong conviction regarding particular loan prepayment(s), in which case a customised (lower) debt yield may be applied as (C).

Sequential Paydown

- For timely-pay notes (whether or not currently senior) that are issued by sequential CMBS, Fitch will rank loans in order of stressed debt yield and calculate (C) the lowest WA stressed debt yield corresponding to an aggregate loan balance equal to the sum of the current balance of that tranche and the ones junior to it. Any note where (C) exceeds (B) is considered to have satisfied the minimum conditions for timely interest commensurate with Fitch's Global Structured Finance Rating Criteria.

Modified Pro Rata Paydown (mix of pro rata and sequential)

- Timely-pay notes (currently senior): For those notes that are issued by modified pro rata CMBS, Fitch will determine a stressed debt yield (D) between (A) and (C) for the purpose of comparing cash flow sufficiency to meet timely payments (B). The selection of (D) depends on the proportion of pro rata and sequential paydown proposed in the structure, the size of the loans in the pool and the size of the tranche in question. Any note where (D) exceeds (B) is considered to have satisfied the minimum conditions for timely interest commensurate with Fitch's Global Structured Finance Rating Criteria.

- Timely-pay notes (not currently senior): For those notes that are issued by modified pro rata CMBS, Fitch will rank loans in order of stressed debt yield and calculate (C) the lowest WA stressed debt yield corresponding to an aggregate loan balance equal to the sum of the current balance of that tranche and the ones junior to it. Any note where (C) exceeds (B) is considered to have satisfied the minimum conditions for timely interest commensurate with Fitch's Global Structured Finance Rating Criteria.

For notes that do not pass any of the tests above but are eligible for liquidity support, a more detailed analysis of external liquidity sufficiency as described in the Fully specified tests section below is performed.

For notes that do not pass any of the tests above and are not eligible for liquidity support, their rating is lowered until at least one of the tests passes.

These tests are implicitly calibrated for the full current balance of the relevant note (with the exception of the most junior tranche). In scenarios where a (non-most junior) tranche can be partially repaid, its effective coupon will fall, mitigating the risk of adverse loan debt yield selection on timely-pay.

Screening Tests for Currently Deferrable Notes Rated Investment Grade

For deferrable notes that pass test 1 above or whose underlying loans remain current for interest throughout the 'Bsf' rating case, Fitch considers them to have satisfied the minimum conditions for timely interest commensurate with Fitch's *Global Structured Finance Rating Criteria* for investment grade ratings. Otherwise, to assess these rating categories, test 2 and, if necessary, test 3 will be modified so that loan and note debt yields will be calculated under the 'Bsf' rating case.

For the avoidance of doubt, deferrable notes may also be subject to the "Timely-pay" tests in the section above because they can become senior.

For notes that do not pass any of the tests above but are eligible for liquidity support, a more detailed analysis of external liquidity sufficiency as described in the Fully specified tests section below is performed.

For notes that do not pass any of the tests above and are not eligible for liquidity support, their rating is lowered to below investment grade.

Fully Specified Tests

Subject to the results of the various tests above, the following scenarios may apply:

- Equilibrium Rate of Interest: The available stressed borrower income is summed (capped for each borrower at the corresponding loan claim for multi-borrower deals) and compared with the interest (and, if scheduled, principal) due on the classes being tested (plus senior interest and expenses) for the duration of the recovery process.

- High Rate of Interest: The available stressed borrower income (assuming RVDs consistent with stable/decreasing interest rate scenarios) is summed (capped for each borrower at the corresponding loan claim for multi-borrower deals) and compared with the interest (and, if scheduled, principal) due on the classes being tested (plus senior interest and expenses) for 12 months.

Appendix 10: Negative Pooling

In EMEA CMBS, the first loss investor would suffer a loss if even one loan in the pool underperforms. The risk increases with the loan count, and where there are at least five loans Fitch performs an additional test to account for so-called negative pooling risk. With thin junior tranches, this risk could also affect more senior investors. This warrants Fitch to perform a test on notes rated in the category one rating above the first loss piece. Where there is an unrated first loss piece, for these purposes only, it is assumed to be rated one category below the lowest rated note.

For the lowest ranking liability (including any unrated liability funding any issuer "over-collateralisation") and any others in the same rating category, Fitch counts the number of loans that "contribute" to liabilities with MIR in the category one rating above the first loss piece. A "contributing loan" is any that suffers a loss, in Fitch's EMEA CMBS asset model, in the rating case one category higher than that associated with the first loss tranche (but which pays off in full in the rating case associated with the first loss tranche). Fitch assumes a number of the loans ("first affected loans") in the "first contributing loan pool" would nevertheless suffer a loss in the rating case associated with the first loss tranche in line with the table below. This results in its rating (if applicable) being lowered from its MIR by a number of notches equal to the number of first affected loans.

Number of Affected Loans

Number of contributing loans	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20+
Affected loans (first or subsequent)	-	-	-	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3

Source: Fitch Ratings

For any subsequent-loss piece with MIR one category higher than the first loss tranche's MIR, Fitch identifies a "subsequent contributing loan pool" consisting of the loans that suffer a loss, in Fitch's EMEA CMBS asset model, in the rating case one category higher than that of the subsequent-loss tranche (but which pay off in full in the rating case associated with the subsequent-loss tranche). Fitch assumes a number of the loans in the subsequent contributing loan pool ("subsequent affected loans") would nevertheless suffer a loss in the rating case associated with the subsequent-loss tranche in line with the table above. Fitch assesses the adequacy of CE (for the subsequent-loss tranche) for potential losses on all affected loans (summing up first affected loans and subsequent affected loans), with any rating adjustment being determined as per the table below.

Subsequent-Loss Piece Rating Adjustment

	# notches reduction from MIR
CE equals 50% or more of first and subsequent affected loans' balance	0
CE equals [25-50%) of first and subsequent affected loans' balance	1
CE equals [12.5-25%) of first and subsequent affected loans' balance	2
CE equals [0-12.5%) of first and subsequent affected loans' balance	3

Source: Fitch Ratings

For the subsequent-loss piece test above, which contributing loan becomes an affected loan is anchored by the median (by balance) of the respective contributing loan pool. So, if there is one affected loan, it will be the median; if there are two, they will be the median plus the next largest; if there are three, they will be the median plus the next largest and next smallest.

Worked Example: Application of Negative Pooling Adjustments

The table below shows model-implied results for 10 loans, of which five (loans 1 to 5) contribute to the first loss tranche MIR (Bsf). For a contributing loan pool of 5 loans, 1 loan (loan 3 since it is the median) is identified as the first affected loan. The MIR of the EUR55m first loss tranche (B-sf) is one notch lower than the MIR.

To assess the notes one MIR category higher (BBsf), we find a further five loans (loans 6 to10) in the subsequent contributing loan pool. These result in one additional loan (loan 8 since it is the median of the subsequent contributing loan pool) being identified as the subsequent affected loan. The available CE (EUR55 million) is sufficient to cover 27.5% of the two affected loans' balance (EUR200 million), resulting in the rating (BB-sf) being one notch lower than the MIR.

Contributory Tranching (EURm)

Proceeds in MIR Categories	Loan 1	Loan 2	Loan 3	Loan 4	Loan 5	Loan 6	Loan 7	Loan 8	Loan 9	Loan 10	Total
AAAsf	120	100	50	35	25	140	110	60	45	30	715
AAsf	20	10	10	5	5	20	10	10	5	5	100
Asf	10	10	10	5	5	10	10	10	5	5	80
BBBsf	10	10	10	10	5	10	10	10	10	5	90
BBsf	20	10	10	10	5	20	10	10	10	5	110
Bsf	20	10	10	10	5	0	0	0	0	0	55
Total	200	150	100	75	50	200	150	100	75	50	1,150

Source: Fitch Ratings

Appendix 11: Income Strips vs Credit-Linked Transactions: Determining Which Analysis Applies

Rated tenant?	Assignable lease without assignor guarantee?	Tenant insolvency triggers forfeiture?	Rating analysis used[a]	Rationale
Y	N	Y	Credit-Linked Transactions	Assumes lease credit quality is equivalent to tenant's IDR.
Y	N	N	Higher of Income Strips and Credit-Linked Transactions	Assumes lease credit quality is equivalent to tenant's IDR. An income strip approach could achieve a higher rating because an insolvency practitioner needing to protect value could seek to avoid forfeiture caused by non-payment by prioritising lease payments or by organising a disposal within the applicable grace period.
Y	Y	N	Income Strips	Uncertainty about the tenant quality is mitigated because an insolvency practitioner needing to protect value could seek to avoid forfeiture caused by non-payment by prioritising lease payments or by organising a disposal within the applicable grace period.
N	Y			
N	N			
Y	Y	Y	Not Rateable	Uncertainty about tenant quality is not mitigated. Lease forfeiture triggered upon tenant insolvency introduces a cliff risk because we assume insolvency can arise without warning for unrated tenants.
N	Y			
N	N			

[a] This relates to probability of default analysis based on timely lease payments. If the analysis requires assessment of ultimate recovery, the Income Strips analysis is applicable to all, with any Credit-Linked Transactions approach acting as floor, if relevant.

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